

Rock Products

DEVOTED TO THE PRODUCTION
OF ROCK AND ITS PRODUCTS

Vol. VI. No. 2.

LOUISVILLE, KY., DECEMBER 22, 1906.

MANUFACTURED PRODUCTS
AND CONCRETE EDITION

"NOT A SACK OF CEMENT IN THE HOUSE" You can avoid this expression and always have it to-day by reading

The American Gypsum Company's Ad On Page 85.

UNION MINING COMPANY,

Manufacturers of the Celebrated

MOUNT SAVAGE
FIRE BRICK
GOVERNMENT STANDARD.

DEVOTE a special department to the manufacture of Brick particularly adapted both physically and chemically to

**Lime Kiln and
Cement Kiln
Construction**

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

UNION MINING CO.,
Mount Savage, Md.
CAPACITY, 60,000 PER DAY.
ESTABLISHED, 1841.

See what The American
Cement Co. have to say
on page 12.

Ottawa Silica Co.'s Washed White Flint Sand

Is used for sawing stone in more than a dozen states. Cuts more and lasts longer than any other sand on the market. Unexcelled for Roofing, Facing Cement Blocks, White Plaster, etc. Freight rates and prices on application.

OTTAWA SILICA CO.. - Ottawa, Ill

"Howard Cement" IT IS NON-STAINING.
IT IS WHITE.
IT IS NON-FREEZING.

HOWARD CEMENT PLASTER the most perfect wall plaster made

Favor us with your inquiries. **Howard Hydraulic Cement Co.** CEMENT, GEORGIA.



Phoenix Portland Cement UNEXCELLED FOR ALL USES.

Manufactured by
PHOENIX CEMENT CO.
NAZARETH, PA.

Sole Selling Agent **WM. G. HARTRANFT CEMENT CO.**
Real Estate Trust Building PHILADELPHIA, PENNSYLVANIA

"RELIANCE" BELT ABSOLUTELY BEST

FOR GRIFFEN MILLS
FOR TUBE MILLS
FOR BALL MILLS

Chicago Belting Company
MAKERS

67-69 South Canal Street,

SEND US YOUR SPECIFICATIONS.

CHICAGO, ILL.

ALMA
Portland Cement

STANDARD BRAND
OF
MIDDLE WEST.

Specially Adapted to all Reinforced Concrete and High-Class Work.

Alma Cement Co.,
WELLSTON, OHIO

DEXTER Portland Cement
THE NEW STANDARD

Sole Agents **SAMUEL H. FRENCH & CO.** Philadelphia



BAGS FOR LIME AND CEMENT

We have recently purchased the factory of the Toledo Paper Bag Co. and have tripled the capacity, and are now in position to make prompt shipment of all orders with the best quality of paper. Prices quoted and samples mailed on receipt of inquiry.

The Urschel-Bates Valve Bag Co. Toledo, Ohio

**Improved Shield
Cement**

The Best Natural Cement
With 3 parts sand—425 lbs. 1 year.
Economical for Concrete.

LAWRENCE CEMENT CO.
OF PENNA.

SIEGFRIED, PA. PAMPHLET FREE.



MARQUETTE PORTLAND CEMENT

Gives Absolute Satisfaction for All Kinds of Concrete Work.

MARQUETTE CEMENT MANUFACTURING CO.,

MILLS: LA SALLE, ILL.

SALES DEPARTMENT: MARQUETTE BLDG., CHICAGO.

The O'Laughlin Revolving Screen

For Granite, Stone, Sand, Gravel, Coal, Coke or anything requiring separation.

THE principle of separating is exactly opposite that of the older style revolving screen, the materials being discharged on coarse perforations first. The coarse material is immediately separated from the finer in each of the concentric screens to the different required sizes.

The type of screen here illustrated is in use at a No. 8 Crushing plant for limestone (which was formerly equipped with three of the older style screens and required an outlay of \$350.00 for each 100,000 cu. yds. of stone separated. Up to the present time it has made perfect separation into five sizes of 300,000 cu. yds. with a recent outlay of \$27.00 for renewing the portion of the screen that the stone has been discharged on, and should do as much more without any additional outlay.

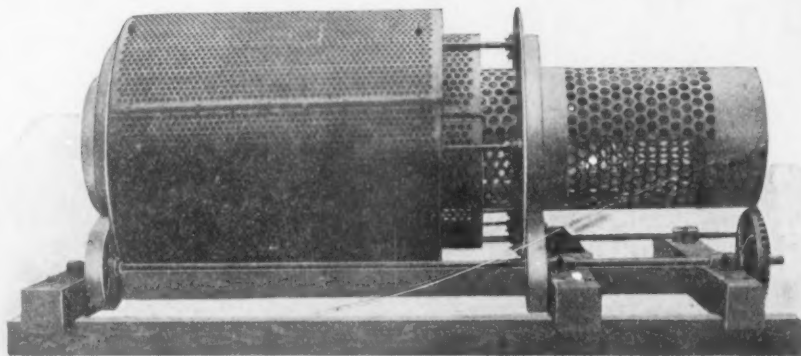
The inside or longest screen is 8 feet long and 36 inches in diameter, the next concentric screen is 7 feet 6 inches long and 48 inches in diameter, the next screen is 7 feet long and 58 inches in diameter, the next is 6 feet 6 inches long and 66 inches in diameter. With the exception of the inner screen each section is adjustable and the screen is complete without it. The figures given above give 492 sq. ft. of

screen surface which is equal to 3 screens of the old pattern, 14 feet long and 36 inches in diameter.

We claim it requires but one-fifth the power to operate our screen than the old style and yet it does the same amount of work. This is proven first, by the length of screen; second, by the size of driving pinion in comparison with gear; third, by the size of trunnions in comparison to the tread of screen. The material to be sep-

arated and weight of screen rests above the bearing points. While in the old style screen it is below the center of bearing points. The material being immediately separated by dropping into each of the concentric screens reducing the wear on screens to the minimum.

Let us know your requirements, what materials you wish separated, the amount daily and the different sizes, and we will furnish an estimate as to cost, power required, etc.



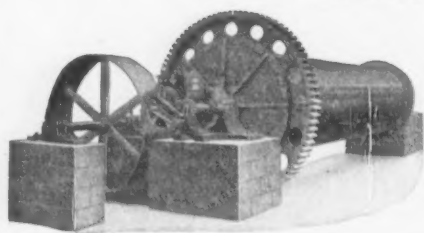
JOHN O'LAUGHLIN, - - - RACINE, WIS.

Allis-Chalmers Company

MILWAUKEE, WISCONSIN, U. S. A.

Cement-Making Machinery

for every stage in Cement making by either the Wet or Dry Process.



Gates Tube Mill.

Ball Mills

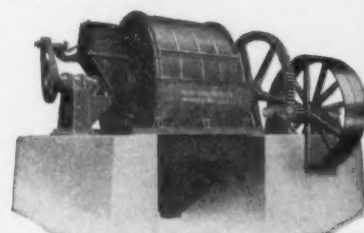
Tube Mills

Kilns

Conveyors



Style "K," Gates Rock and Ore Breaker.



Gates Ball Mill with Feeder Attached.

Rock Breakers

Crushers

Dryers

Elevators

We are prepared to make most attractive quotations on Silix Linings, C. I. F., New York, delivery subject to ocean transit; and we solicit inquiries from users of this material.





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OF ROCK AND ITS PRODUCTS

Vol. VI. No. 2.

LOUISVILLE, KY., DECEMBER 22, 1906.

MANUFACTURED PRODUCTS
AND CONCRETE EDITION

Modern Uses of Concrete—Bridge and Dam Construction.



RE-INFORCED CONCRETE BRIDGE NEAR BELVIDERE, ILL., ON THE LINE OF THE ELGIN & ROCKFORD ELECTRIC R. R.

This bridge was built by the Strauss Concrete Bridge Co., Fort Dearborn Building, Chicago, Ill., contractors. The total length is 350 feet. The spans are 81 feet in the clear with a 7 per cent dip. The piers are $6\frac{1}{2}$ x 18 feet. 100,000 barrels of Atlas Portland cement were used to make the concrete for this job, which has just been completed.



MAIN DAM GREAT NORTHERN POWER CO., NEAR DULUTH, MINN.

This splendid piece of engineering work has been completed under the direction of F. A. Cokefair, chief engineer, for the Great Northern Power Co. The contractors were the National Railway Construction Co., of which Thomas Pettigrew was the chief engineer. 60,000 barrels of Universal Portland cement were used in making the concrete for this mammoth dam in conjunction with the dependent operations.

The Hoosac Valley Lime & Marble Co.

=====ADAMS, MASS.=====

Manufacturers of

....High-Grade Finishing Lime....

Noted For Its Quick and Even Slacking.

Now in Use in Some of the Largest Buildings Being Erected in New York City.

THOS. D. CONNORS, President.

Telephone
Connection

New York Office: 1123 Broadway.

The Ohio and Western Lime Company,

WORKS AT

Fostoria, Ohio.
Gibsonburg, Ohio.
Sugar Ridge, Ohio.
Tiffin, Ohio.
Huntington, Indiana.
Geneva, Ohio.
Limestone, Ohio.
Lime City, Ohio.
Portage, Ohio.

MANUFACTURERS OF AND WHOLESALE DEALERS IN

Ohio White Finishing Lime, Ground
Lime, Lump Lime, Fertilizer, Hydrate
Lime, Cement, Plaster, Hair, &c., &c.

Capacity
8000 Barrels
Per Day.

Offices: TOLEDO, O. 209-210-11 Chamber Commerce Bldg.

HUNTINGTON, IND.



**Big
B**



Lime.



BIG B LIME

ITS HISTORY IS A STORY OF SUCCESS.

The Building Trades' Barometer. The Iron and Steel industry promises increased activity. It is predicted that a new tonnage record in that business will be established.

This means a large demand for LIME, and transportation facilities taxed. Isn't it wise to arrange early for your supply of LIME?

BIG B's quality is unsurpassed. That means satisfied and contented contractors for you. Our quick shipping facilities mean fresh lime on short notice.

A POSTAL CARD WILL BRING OUR 1905 MEMORANDUM BOOK.

THE NORRIS AND CHRISTIAN STONE AND LIME CO.
MARION, OHIO.

Tell 'em you saw it in ROCK PRODUCTS.

DOES NOT DETERIORATE WITH AGE.



WILL NOT SLACK. ALWAYS READY FOR USE.

Excelsior Hydrated Lime

A PRODUCT OF MERIT.

The best prepared Lime in the market. Is superior to hot Lime for all purposes. Will not deteriorate. Absolutely pure and free from foreign ingredients. Successfully used for more than two years by the largest users of Hydrate in the country.

SEND FOR PRICES.

MADE ONLY BY

The Cleveland Builders Supply Co. Cleveland, O.

Try us on your Portland Cement requirements

Farnam "Cheshire" Lime Co.

OF CHESHIRE, MASS.
MANUFACTURERS OF THE

Celebrated "Cheshire" Finishing Lime.

Well known throughout New York and the Eastern States as the finest finishing lime manufactured. The special feature of this lime is its quick and even slacking, thus preventing any cracking or checking when put on the wall. It is the best lime used in the country today for all

HIGH GRADE FINISHING WORK

Selling Department, 39 Cortlandt St., N. Y., C. J. CURTIN, Pres't.

ROCHESTER LIME CO.

209 Main St., West, Rochester, N. Y.

MASONS' SUPPLY DEPOT

Manufacturers of, and Wholesale Dealers in

Snow Flake Lime, Cement Building Blocks, Alpha Portland Cement, Hoffman Rosendale Cement, Cummings Akron Cement, Kings Windsor Wall Plaster, Kings Plaster Paris, Fire Brick, Fire Clay, Dynamite, Caps, Exploders, etc.

JOIN THE INFORMATION BUREAU DEPARTMENT. All it costs is to be a regular subscriber to the paper. The object of this department is to assist our subscribers in every possible way.

The Bates Engineering and Construction Co.

DESIGNERS AND BUILDERS OF

Lime Kilns and Complete Lime Plants

Plans and estimates furnished for coal, wood or producer gas kilns. Designers and builders of the only known kiln that will burn a soft stone economically. Sixteen years' experience. Contracts taken in any part of the country. :: :: :: ::

OFFICE: GREAT BARRINGTON, MASSACHUSETTS.

Tell 'em you saw it in ROCK PRODUCTS

Section of
Old Style Flight

Section of
Helicoid Flight

HELICOID

Helicoid conveyor has a stronger flight and a heavier pipe than the same diameter of old style conveyor, and

Helicoid flight and pipe are put together so they support and strengthen each other.

Helicoid flight has a shovel edge. Other has blunt edge.

Helicoid flight is one continuous strip of metal end to end of pipe. Other is short sections lapped and riveted together every turn or half turn around the pipe.

Helicoid is a smooth, nicely-balanced spiral, and has no joints to wear out and open up.

Helicoid requires fewer repairs, and less power to drive it.

Helicoid costs no more than inferior kinds of conveyor; it's all-round satisfaction at the same price.

Catalog
28

Ask about our Steel Conveyor Boxes, too.

H. W. Caldwell & Son Co.
17th St. and Western Ave., Chicago

BRANCH OFFICE:
No. 95
Liberty St.,
New York City

AGENTS:
Woodward, Wight
& Co.,
New Orleans, La.

The **Strongest White Lime**

ON THE MARKET

Uniform Quality

Finest Grain

The American Clay Machinery Co.

WILLOUGHBY, OHIO

May 16, 1906.

The Mitchell Lime Co.,
Mitchell, Ind.

Dear Sirs:

Replying further to your favor of the 8th inst requesting us to advise you the result of practical test of your lime in the manufacture of sand-lime brick. We are pleased to advise you that the lime hydrated easily and the brick made from it were first-class in every respect.

We have forwarded some samples of it to Mr. Eikus of the Indianapolis Composite Brick Co. and he can probably advise you further.

Very truly yours,

The American Clay Machinery Co.
by W. J. Burke.

MITCHELL LIME COMPANY

MITCHELL, INDIANA

WESTERN LIME CO.

HUNTINGTON, INDIANA

MANUFACTURERS OF

LUMP LIME

ALSO, DIAMOND BRAND SUPERIOR WHITE FINISH

A HYDRATED LIME

AND A GROUND AND FERTILIZER LIME

Capacity 4,000 barrels or 10,000 bushels per day. Capacity of Hydrated Lime, 120 tons per day. Our LUMP LIME as well as our HYDRATED LIME is the very best obtainable for all purposes for which a good lime is needed in erecting buildings. Our HYDRATED LIME is absolutely the best finishing lime on the market.

FOWLER & PAY,

Brown Hydraulic Lime, Austin Hydraulic Cement, Jasper Wall Plaster, Brick, Stone.

CEMENT WORKS: Austin, Minn.
PLASTER MILL: Ft. Dodge, Iowa.
WAREHOUSE: Minnesota Transfer.

MANKATO, MINN.



ASH GROVE

WHITE LIME ASSOCIATION

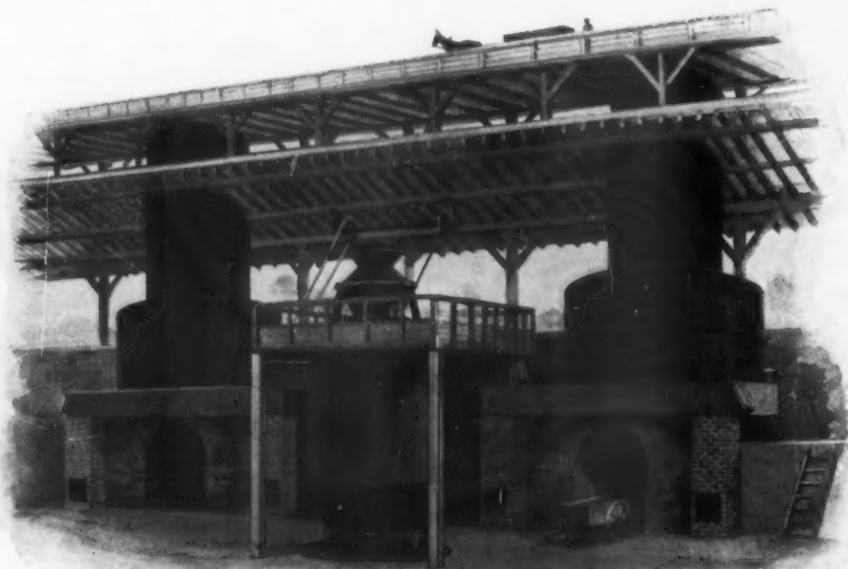
MANUFACTURERS OF

**High Grade
White Lime.**

KANSAS CITY, MISSOURI.

Gas Producer Plant of the New England Lime Co., New Milford, Connecticut.

**PRODUCER GAS
Makes the Best Lime
It increases the
Capacity of a Plant
and Reduces the
Fuel Bill**



**The Total Cost of
This Installation
Will be Paid for by
the Saving Effected
During the First
Year of Operation**

We are now equipping a second plant for above company at Canaan, Ct.

MORGAN CONSTRUCTION CO., Gas Producer Dept., Worcester, Mass.

Pittsburg Representative, Geo. A. Harwood Company, 2011 Farmers Bank Building, Pittsburg, Pa.

Tell 'em you saw it in ROCK PRODUCTS.

"Selling all the Lump Lime we can make"

(From some correspondents.)

Well, so is the other fellow but—this is no argument in favor of "Lump" over Hydrate.

It's simply because the "building boom" NOW demands every pound that can be turned out and "you're only getting your share" while the boom is on.

Now then—while EVERYBODY WANTS LIME why not begin to give them a better article and make a MUCH LARGER PROFIT. (The time to make the largest profits is when the public wants your stuff.) Next season will be a top-notch one.

"Selling all the Hydrated Lime we can produce"

(From our customers.)

and producing all the time instead of shutting down in dull seasons and, (pound for pound) making 20% MORE PROFIT.

Hydrating changes your lime from a perishable to an IMPERISHABLE PRODUCT, which can be stored or shipped any distance without trouble, only freight rates limit your shipping distance.

The number of possible customers is greatly increased because there are so many uses for Hydrate besides the regular lines.

If you know all about HYDRATE, it's time to buy a CLYDE HYDRATING PLANT.

If you don't know all about it, let us tell you a few more facts.

"We like to answer questions".

Anyway get our "booklet" and take up this important matter before next season's rush starts in.

CLYDE IRON WORKS,

Manufacturers.

DULUTH, MINN.

Economy Dictates

that the jaw-plates, cheek-plates, cones and concaves of your crushers should be made of

"Taylor-Made" **MANGANESE STEEL** "Taylor-Made"



The actual ratio of wear in "Taylor-Made" plates, as compared with other castings, has been proved by large users in hundreds of cases to warrant their use.

"THE REASON'S IN THE STEEL."

We shall be pleased to give you further information.

Taylor Iron & Steel Co.

HIGH BRIDGE, N. J.

Modern Grinding Machinery

KOMINUTERS for granulating
TUBEMILLS for pulverizing

Davidson Tubemill especially
adapted for Sand-Lime
Brick Work.

Silex Linings for Tubemills
Best Quality Dana Flint Pebbles
Forged Steel Balls

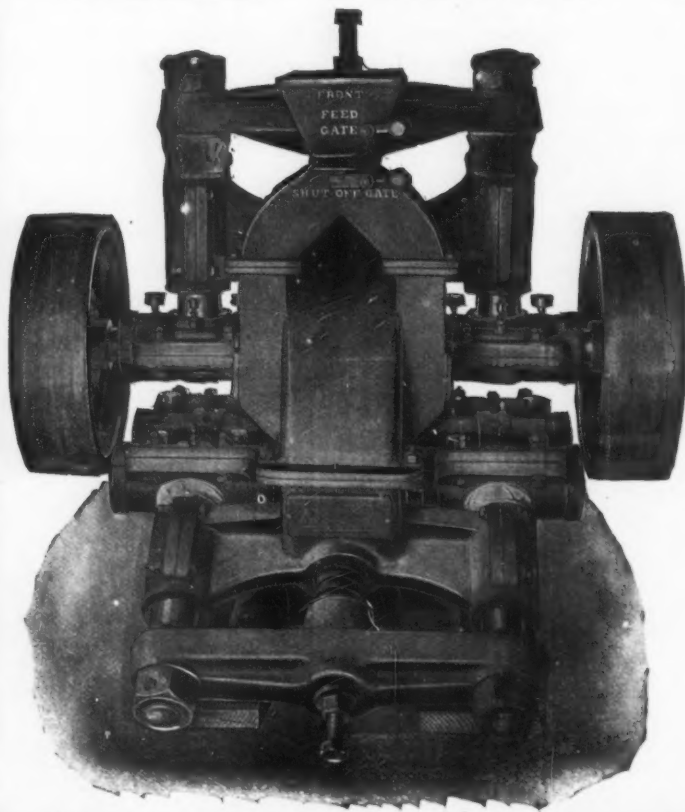
F. L. SMIDTH & CO.

ENGINEERS

41 Cortlandt St.,

NEW YORK

THE KENT PULVERIZER



Takes one inch feed. Grinds to any fineness
from 10 to 200 mesh.

GRINDS PER HOUR WITH LESS THAN 25 H. P.

CEMENT CLINKER,	40 bbls. to	98%	20 Mesh.
CEMENT CLINKER,	12 " "	" "	100 "
LIMESTONE,	2½ tons "	" "	200 "
LIME,	4 " "	" "	100 "
ROSENDALE CEMENT,	43 bbls. "	90%	50 "
QUARTZ TRAP-ROCK,	4 tons "	" "	40 "

You can easily figure from this what a
Kent Mill would save for you.

W. J. BELL, Esq. Supt.
NEWAYGO PORTLAND CEMENT CO.,
Newaygo, Mich.

Says:—Four KENT MILLS are driven by one 75 H. P. motor.

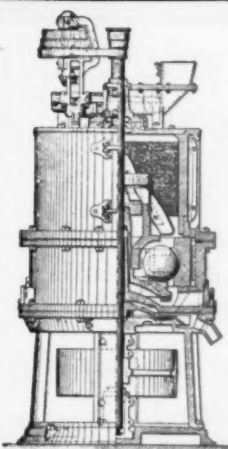
For Catalogs and Information, Address

KENT MILL CO.

170 Broadway,

NEW YORK.

Tell 'em you saw it in ROCK PRODUCTS.



Fuller-Lehigh Pulverizer Mill

The Best Pulverizing Mill Manufactured

Exhaustive tests in all departments, in competition with the most approved grinding machines in use, have demonstrated the superiority of our machine

OUR CLAIMS:

Greater Output

Better Fineness

Fewer Repairs

Dustless

Few extracts from letters received from users:

"With the four we are now ordering we will have in use 16 Fuller Mills in all, and I think you can hope to get orders from us within the very near future for quite as many more."

"We have to say for your Fuller Mill that it is unqualifiedly the best grinding device we have ever tried on our lime rock and eminently satisfactory to us."

"We are pulverizing with one Ball Mill and four Fuller Mills sufficient raw material to produce nearly 1200 barrels of clinkers per day, which record I believe can not be approached by any other mill on the market."

If interested, write us for further information

LEHIGH CAR, WHEEL & AXLE WORKS, CATASAVQUA, PA. U. S. A.

STURTEVANT GRINDING MILLS

SIX KINDS

FOR

Hard, Soft or Medium Rock.

Produce a finished product without screens.

SEND FOR CATALOGUE

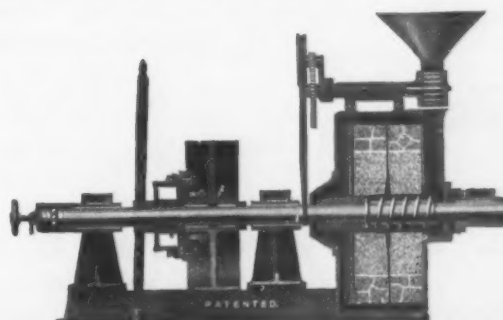
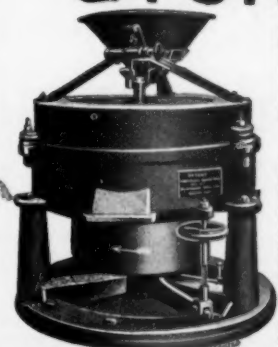
OF

ROCK AND ORE REDUCING MACHINERY.

STURTEVANT MILL COMPANY

105 CLAYTON STREET.

BOSTON, MASS.



Do You Grind Paints or Pigments?

Do you use the Raymond System of Pulverization and Air Separation? Would you use it if you knew it would SAVE YOU MONEY and INCREASE YOUR EARNINGS? Write to any of the following satisfied customers:

NATIONAL LEAD CO., Chicago: We are very glad to say that the Raymond Pulverizer, which we have used in our oxide works for several years past, has done its work with perfect satisfaction, and we consider it the best machine for that purpose that we know anything of. It gives a very uniform and regular product in the way of fineness, and does not get out of order easily, being very reliable in its working in every respect.

WESTERN DRY COLOR CO., Chicago: In the three years we have used your mills they have worked to our satisfaction, turning out a uniform fine product and requiring but few repairs.

THE IOWA PAINT MFG. CO., Fort Dodge, Ia. We have used one of your cyclone mills for eleven years, and we highly recommend it after that long service for first class pulverizing work. Your machinery needs but little attention and if it has a fair show it will give perfect satisfaction.

CARTER WHITE LEAD WORKS, Chicago: We have used your Separator for separating out tailings from the red lead and litharge with satisfactory results.

WARREN BROTHERS CO., Boston, Mass. We have been using your mill at our refinery a great deal in the last three years and during the past six months have been grinding magnesite with it, getting 75% passing 200 mesh screen. This latter material we were unable to grind to this fineness with any other mill.

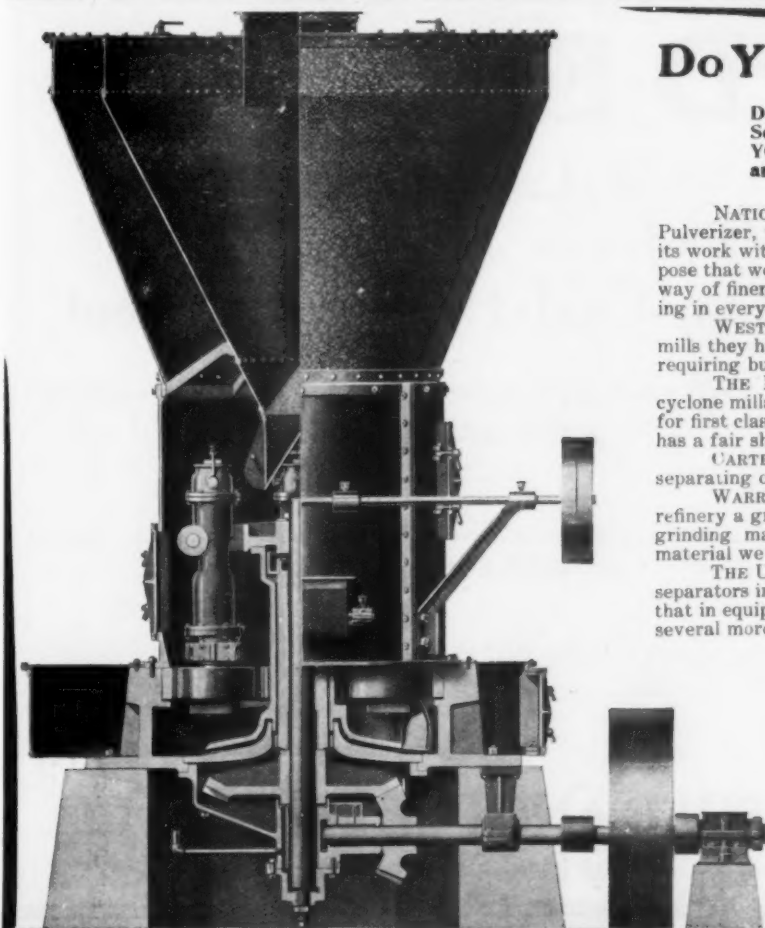
THE UNITED STATES GRAPHITE CO., Saginaw, Mich. We have used your separators in our plant here at Saginaw upwards of ten years with such satisfaction that in equipping the new plant which we moved into only a year ago, we installed several more of them.

These are a few out of the many, all highly satisfied users of the **RAYMOND SYSTEM**. How would you like to travel in their care-free class?

Raymond Bros. Impact Pulverizer Co.

141 Laflin Street,

CHICAGO



Tell 'em you saw it in ROCK PRODUCTS.

The
STROUD MILLS
OUTDO ALL OTHERS

In quality of grinding and in output per horse-power per hour on most kinds of work, and they grind for less money per ton.



Our Air Separation Pulverizers produce direct from mill, any desired mesh, from say 40x40 down to the most impalpable powders, at will of operator, at a moment's notice. Dustless in operation. Do away with sieving entirely.

We build Screen Separation Mills too.

Catalogue on request.

E. H. STROUD & CO.

ENGINEERS & MANUFACTURERS

30-36 LaSalle Street, CHICAGO, U. S. A.

**We Manufacture and Erect
Complete Gypsum
Plants**

Of small or large capacities, for making Plaster of Paris or Stucco. We also build complete ready mixed Plaster Plants.

The C. O. Bartlett & Snow Co.
CLEVELAND, OHIO

PATENTS

Secured promptly and with special regard to the legal protection of the invention. Advice as to Patentability and Commercial Value Free. Write for Inventor's Hand Book.

SHEPHERD & PARKER

Patent Lawyers

"During the past ten years Mr. Shepherd, of Shepherd & Parker, has obtained for us a great many important patents. We have no hesitation in heartily recommending him to anyone having need of the services of a patent attorney."

HALLWOOD CASH REGISTER CO.

Mr. Parker on November 1, 1903, resigned his position as an Examiner in the U. S. Patent Office to enter this firm.

Address,

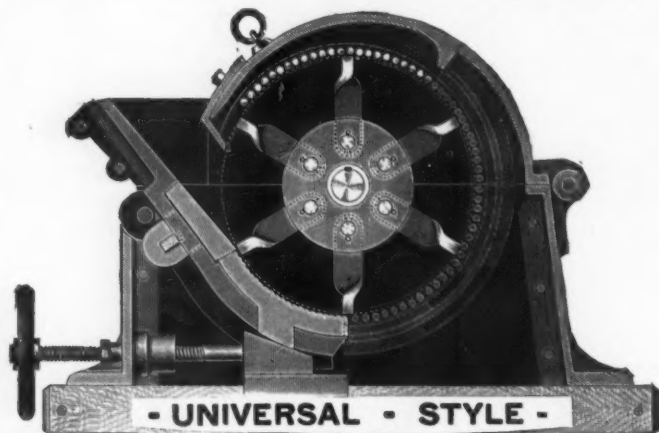
146 Dietz Building, Washington, D. C.

GRINDERS

THE NEW WILLIAMS

will grind

Lime - Limestone - Gypsum - Clay - Coal - Hydraulic Cement



Will grind above material from 2 in. size and under to 8-10-16-20-30-40 Mesh and finer.

CAPACITIES

$\frac{1}{4}$ - 1 - 2 - 3 - 5 - 8 - 10 and 12 Tons Per Hour.

1000 WILLIAMS MILLS IN USE.

Write for Catalogue 12.

THE WILLIAMS PAT. CRUSHER AND PULVERIZER CO.

Works: ST. LOUIS

Old Colony Building, CHICAGO

Tell 'em you saw it in ROCK PRODUCTS.

Take Time by the Forelock

If you want to do a rousing lime business in the spring, you've got to begin to get ready for it NOW. Get your plant up and get busy hydrating. Let the people know you mean business, and that you've got the stuff to sell. Spread the news all about you everywhere. Let the builders and everybody who uses lime know how much better hydrated lime is than the old-fashioned kind. Show them how much more convenient hydrated lime is to handle, how much easier it is to work and how much more economical it is. Do you know that plaster and mortar from hydrated lime gains increasing strength with age? Well, it does. The older it gets, the stronger it is.

Hydrated lime can be used in more ways than lump lime can. You can sell much more hydrated lime than you ever could of the other kind, and there's no chance for loss on it. It don't air slack. It don't swell and burst the bag. As little or as much may be used as needed, and the rest will keep good for years.

We'll be glad to tell you all about it. It won't cost you more than a postage stamp to find out. The man who never investigates new things never accomplishes much in this world. It's the man who is up and doing and gets there before everybody else does—he's the man who reaps the harvest. There will always be money in hydrated lime, because hydrated lime is as staple as flour; but the men who get into the field early are the men who are going to get the bulk of the trade.

We are makers of machinery for hydrating lime. We will furnish you anything from a sprocket wheel to a complete plant, and guarantee whatever you get from us to be the best of its kind in the country. We have the most up-to-date and successful method. Our machinery is tried and tested, and we've had more real experience in this business than all our competitors put together. That's a broad statement, eh? Well, We Can Prove It.

You can't afford to wait. Write Us Now.

*The Kritzer Company,
Western Ave & 17th St.,
Chicago, Ill.*

? THE IMPORTANT QUESTION

A RELIABLE PAPER BAG

THAT will stand severe handling, and arrive at destination without damaged contents, has been the one desire of the cement and hydrated lime manufacturer. We have solved the problem and can convince you with the first order.

The West Jersey Paper Mfg. Co.

Front and Elm Streets

CAMDEN, N. J.

Improved Utica Hydraulic Cement

The finest ground and highest grade Natural Cement manufactured in the U. S. Every car tested by Robt. W. Hunt & Co., and their test furnished on every car shipped.

MEACHAM & WRIGHT CO. Sole Agents, Chicago.

CHARLES W. GOETZ LIME & CEMENT CO.

MANUFACTURERS OF AND DEALERS IN

Glenwood Lime, Banner Brand Louisville Cement, Portland Cements and Building Materials.

St. Louis, Mo.

RAH! RAH! RAH!



25 to 0



That's the way Rock Products' Advertisers win the Game.

WE ARE ALWAYS READY TO ROOT FOR YOU.



Reduce Your Screen Expenditure

We want you to know why "Tyler" Double Crimped Screens have such extraordinary long life; why the meshes are all uniform and accurate even when the wires are almost worn away and why we can guarantee to reduce your screen expenditure. This is all made clear in our interesting book on "Screens," which is also complete in technical information. Put your name and address on the coupon below and mail it to us.

The W. S. Tyler Company

Manufacturers of Wire Cloth from 4-inch Mesh to 200 Mesh.

CLEVELAND, OHIO.

TEAR OF HERE.

THE W. S. TYLER COMPANY, Cleveland, Ohio.

Please send free of all expense your new book on "Screens."

Mark for Mr. _____

Name of Company _____

Address _____

Dept. "R. P."

Chicago Portland Cement Co.



MANUFACTURER OF...

**"CHICAGO AA"
PORTLAND CEMENT.**

We make one brand only

The best that can be made

A Standard Portland for Universal Use.

Present daily output
6,500 barrels.
Increasing to
17,000 barrels.



Plants at
Chicago and
Pittsburg.

Universal Portland Cement Company

Successor to Cement Dept. Illinois Steel Co.
The Rookery Building, CHICAGO, ILL.



ONE GRADE—ONE BRAND.

**The Recognized Standard
American Brand.**

General Offices: EASTON, PA.

SALES OFFICES:

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MANUFACTURED BY

Lehigh Portland Cement Co.

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Write for Catalogue. Capacity, 7,000,000 Yearly.

HYDRATED PORTLAND LIME

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Buckeye Portland Cement Co.

ESTABLISHED 1888.

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"Buckeye" has stood the wear and tear in many important places for the past fifteen years and under the new process of manufacture is now better than ever. :: :: :: :: ::

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"Giant" Portland Cement

has been used by the foremost engineers, architects, contractors and builders for the past 20 years in the most difficult and important construction ever undertaken in this country, and has been found to be under all conditions

Strong, Sound, Permanent.

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Reputation Unrivalled

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ONE OF THE OLDEST AND THE BEST.

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is not the only Portland Cement,
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Guaranteed that 90 per cent. will pass a
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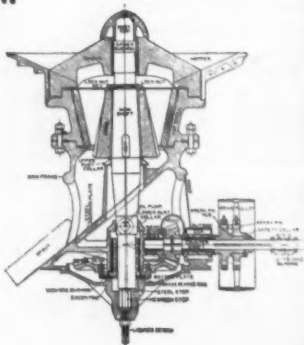
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THE AUSTIN GYRATORY CRUSHER IS THE ONLY ONE HAVING AN AUTOMATIC OILING SYSTEM.



The strain on the bearings of a gyratory crusher is so great that if dust reaches them or if imperfectly lubricated they are certain to be quickly destroyed and the machine laid up for repairs. The bearings of the "Austin" are enclosed in a double chamber—absolutely dust proof—and are lubricated by a constant circulation of live oil forced through the main eccentric bearing—which is the life of the machine by an automatic pump operated directly by the gyratory movement of the main shaft. The lubrication must be perfect because the flow of oil is constant and positive.

In all other gyratory crushers there is only the discharge diaphragm to separate the dust from the bearings and gears, and a side door opens directly into the chamber containing the bearings. Dust gets into this receptacle readily and destroys the gears.

Immediately below the crushing head, in the "Austin" is placed the discharge diaphragm with dust collar the same as in any other gyratory crusher. Below this partition is a second diaphragm also provided with dust collar around the shaft and a dust cap covering the pinion, contained in no other crusher, en-

closing the bearings in a double dust proof chamber and making it simply impossible for dust to reach the bearings.

At the bottom of the frame in the "Austin" is an oil cellar which is filled with oil to the level of the center of teeth in the main gear.

An automatic pump draws pure oil from this cellar, forces it through the eccentric and counter shaft bearings and any oil thrown from the teeth of the driving gear is caught by the cap and carried back to the cellar.

At the bottom of the cellar is a drain by means of which the impure oil can be removed insuring absolutely perfect lubrication because every part of the bearings operates continuously in a bath of pure oil.

One never has to expose the bearings of the "Austin" to dust when in operation. Fill the oil cellar to the required height and the machine must oil itself since no oil can escape from the oil cellar and therefore maintains a constant level.

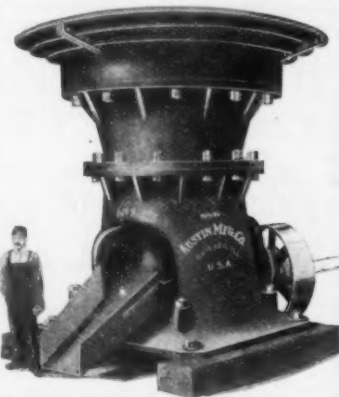
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We are the world's largest builders of rock and earth handling machinery.

Catalogues of all departments on request.

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New York Office, Park Row Building



Vol. II

October, 1906

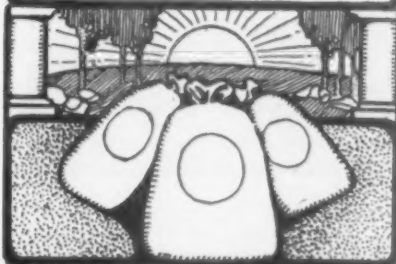
No. 11

CEMENTOLOGY

Circulation 10,000

*Standard Requirements
of
Tensile Strength
and
Constancy of Volume*

Published by
The Whitehall Portland Cement Co.
Philadelphia
Atlanta Boston



Front and back covers of No. 11, Vol. II

CEMENTOLOGY

Jim Smith goes fishing with Old Josh Bent.

Read the October number of Cementology and **get wise on the subject** of Bait and at the same time get a few pointers on

Whitehall Portland Cement

The comprehensive drawing on pages 6 and 7 show clearly how **Whitehall Portland** exceeds the requirements of the standard specifications.

Sample Copy free on application to the
Principal sales office of

The

Whitehall Portland Cement Co.

1719-1724 Land Title Building,

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Candler Building, Atlanta, Ga.

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A Trade Mark



That Stands for Quality

Use Louisville Hydraulic Cement for Foundations

and invest the amount saved thereby otherwise. Concrete made of Louisville Cement is strong enough for foundations of all kinds, and by the use of it a great saving is effected. The following letter from a well-known firm of Chicago architects, written when Louisville Cement was not ground so fine as it is to-day, shows its good quality and suitability for foundations:

CHICAGO, ILL., Sept 29, 1898.

Mr. A. L. Kanagy, care of Western Cement Co., Louisville.

Dear Sir:—In reply to your question concerning the concrete foundations of power house of the South Side Elevated Ry. Co., at 40th and State Sts., Chicago, which foundations were made of Louisville Cement, we beg to say that the foundations have turned out to be perfectly satisfactory, and behaved all the time as we expected they would.

The controversy which arose at one time concerning this was caused by no fault of the concrete or of the cement.

It is true that one of the engines was wrecked and twisted off the foundation bolts without doing any injury to the foundation.

Yours very truly, D. H. BURNHAM & Co.

Louisville Cement mortar made in the proportion of 1 cement to 2 sand, will develop a tensile strength of over 100 pounds per inch in seven days, and will withstand a crushing strength of over 1,000 pounds per inch in twenty-eight days.

Louisville Cement in bags of 4.77 cubic feet per barrel, costs less than 50c per barrel at the mills. At this price a simple calculation will show the economy of its use.

Write for pamphlets and test sheets.

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281 West Main Street,

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**Strength
Durability
Permanence**

Not only laboratory tests, but results in actual work prove the high grade quality of

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Especially adapted for Cement Blocks, Sidewalks, and all forms of concrete and re-inforced concrete construction.

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No. 1 Madison Ave., NEW YORK.

Works at Stockertown, Pa.



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For all Kinds and Conditions of Industrial Service.

IMMEDIATE DELIVERY

We carry at our warehouse the largest stock of Rails, Steel Ties, Portable Track, Switches, Frogs, Crossings, Turntables, Steel and Wooden Flat and Dump Cars of every description.

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KOPPEL
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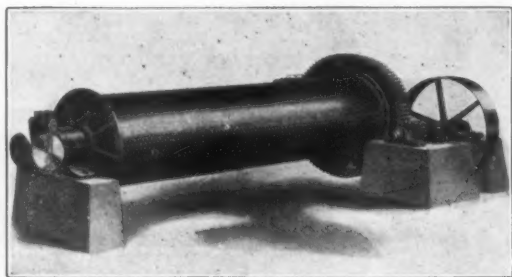


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Designers and Builders of

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of all kinds, for either wet or dry process



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**Rock Breakers, Crushers, Dryers,
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Capacity, 1,500 Tons a Day.

The ten cars shown in cut were loaded in four hours.
Separates sand from gravel as it is loaded on cars.

SHOEMAKER & CASPARIS,
NEWCOMERTOWN, OHIO.

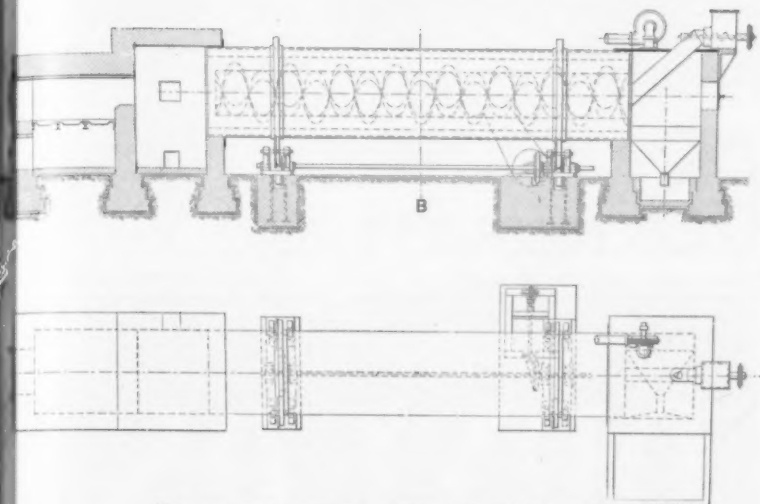
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We shall be pleased to estimate the cost of any dryer upon receipt of full information as to requirements and facilities for operating, accompanied by a sample of the material to be dried.

J. R. ALSING CO., Engineers and Manufacturers

MAIN OFFICE: 136 Liberty Street,

NEW YORK

THE TIES THAT BIND

a brick wall *Better* than any on the market are the *Leader and Acme* Wall Ties for solid or veneer walls. Manufactured by

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OZARK COOPERAGE & LUMBER CO.

MANUFACTURERS OF

Lime, Cement and Salt Cooperage Stock.

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ARE THE BEST

If you do not fire your blasts by electricity, you should send for the booklet



"FIRING BLASTS BY ELECTRICITY"

Which tells all about this method. If you are already using fuzes, you should have the book anyhow, as it contains many valuable hints. Sent free.



No. 1, Capacity, 8 Holes
No. 3, Capacity, 25 Holes
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POWDER
COMPANY**

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WRITE NOW.

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The **Franklin Printing Co.,**

PRINTERS, PUBLISHERS, BINDERS

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LOUISVILLE, KY.

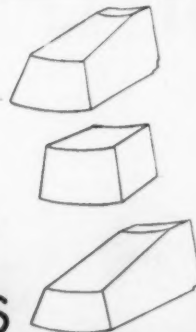
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ROTARY CEMENT LINERS.



LIME KILN LININGS.

IRON TON CROWN.



GROUND CLAY
FOR
WALL PLASTER
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BOILER SETTINGS

DIRECT HEAT

DRYERS

—FOR—

BANK SAND
GLASS SAND
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COAL, ETC.

All Mineral, Animal and Vegetable Matter.

We have equipped the largest plants in existence and our dryers are operating in all parts of the world. Write for list of installations and catalogue S. C.

American Process Company

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DRYERS

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NEW YORK

CHICAGO

The advertising seed planted in Rock Products will grow because its editors keep the soil well cultivated.

Try it and see.

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After twenty years "CLINTON" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CORRESPONDENCE SOLICITED.

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C. K. WILLIAMS & CO.
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The Largest Manufacturers in the U. S.

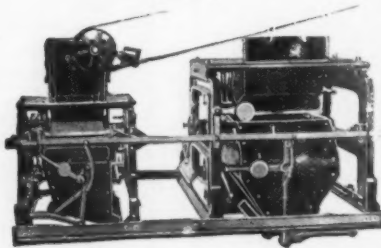
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COLORING
OF ALL SHADES.

Correspondence Solicited. Samples and Estimates cheerfully furnished on application.

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Designers and Builders of the
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Designing and Installing a Specialty.

YOU may make a mistake in your mixtures, but the
Richardson Automatic Scale
CAN NOT



The Richardson weighs accurately, proportions of Sand, Lime, Brick, Color and any other materials.

RICHARDSON SCALE COMPANY,
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DEALERS IN
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Rock Products

DEVOTED TO THE PRODUCTION
OF ROCK AND ITS PRODUCTS

SEMI-MONTHLY.

Entered as second-class matter December 16, 1905, at the Post Office at Louisville, Ky., under Act of Congress of March 3, 1879.

THE FRANCIS PUBLISHING COMPANY,
Publishers.

E. H. DEFEBBAUGH President.

A semi-monthly trade journal devoted to the interests of the manufacturers and dealers in rock products and kindred lines, including Lime, Cement, Salt, Sand, Slate, Granite, Marble, Sandstone, Grindstones, Artificial Stone, Emery Stone, Quarries, Monuments, Manganese, Asphalt, Phosphates, Plaster, Terra Cotta, Roofing and Roofing Tile, Coal, Oil, Mineral Wool, Brick, etc.

EDITORS.

E. H. DEFEBBAUGH. FRED K. IRVINE.

ASSOCIATE EDITORS.

HENRY C. WHITAKER Barre, Vt.
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Regular Staff Correspondents in the Principal Centers.

The mission of ROCK PRODUCTS is to serve the trade in any and every honorable way possible, to promote better profits and make life more pleasant for those engaged in the business to which it caters. With this end in view, criticism is courted, and all are invited to use its columns to further ideas and suggestions for the good of the trade. The office, too, is at the service of the constituents of this paper; so when you want to buy or sell, or merely ask a question, write, and when you are in town, call and make it your headquarters.

"TELL 'EM YOU SAW IT IN ROCK PRODUCTS."

☞ No contracts will be accepted with advertising agencies, as our system for promoting the interests of patrons requires direct co-operation.

☞ Matter for publication to insure insertion in any given number must reach this office at least ten days preceding the date of the paper. This measure is made necessary by the rapid growth of circulation, taking more time in the printing department.

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BRANCHES:

NEW YORK OFFICE—Room 431, 136 Liberty Street.

CHICAGO OFFICE—Room 1312, Tribune Building.

NEW ENGLAND OFFICE—16 Merchant St., Barre, Vt.

LOUISVILLE, KY., DEC. 22, 1906.

Compliments of the Season.

The Merry Christmas tide is with us once again and there is no man who has participated in the past season of universal prosperity but whose heart is filled with appropriate sentiments becoming the holiday occasion. 1906 has been a year of steady and uninterrupted progress in all branches of the great concrete industry and the manufacturer of cement, plaster and lime has nothing to regret when he looks over the handsome returns of his balance sheet. The dealer in building materials should have the Santa Claus feeling permeating through his entire system from the crown of his head to the soles of his feet, for the days and the weeks of the past year have been good to him. The capitalist, the working man, the aged and the little folk are all entitled in this joyous period to reflect back to others they love the hearty satisfaction of these prosperous times. And Rock Products has the Santa Claus feeling also and we extend to every individual of our 20,000 readers our best wishes for a Merry Christmas and a Happy and Prosperous New Year.

Attend Your Trade Convention.

The manufacturer of concrete blocks, the reinforced concrete contractor, the sidewalk man, the engineer and the architect are all invited and urged to attend the third annual convention of the National Cement Users' Association, which will be held in Chicago, with headquarters at the Auditorium Hotel, January 7, 8, 9, 10, 11 and 12, 1907.

There will be something of interest and of great educational value to each and every user of cement, who is wise enough to attend this convention, for the brightest minds in the country who are directing their highest endeavors to promote the concrete industry in all its branches will be present and the disposition of every man at the convention will be to hand out to others the good things that he has developed and acquired during the past season.

The Northwestern Cement Users' Association will also hold their convention after the adjournment of the National Association. The dates they have fixed are the 16, 17 and 18 of January with headquarters at the Auditorium Building, St. Paul, Minn. Let every intelligent user of cement make his arrangements to attend at least one of these great conventions and, if possible, both of them.

CEMENT Users, Meet Us at Chicago, January 7 to 12.

CONTRACTORS complain that labor is as scarce as contracts are plentiful.

A great record has been made in the year 1906 in the building of moderate priced homes.

The introduction of new devices for mixing concrete is still the feature of the industry.

The architect is taking more kindly to the use of manufactured cement products than formerly.

The rapid growth in the demand for lime in its hydrated form is a pronounced feature with the supply dealers.

FUEL economies in the burning of lime and cement clinker are being studied by the progressive manufacturer.

The manufacturers of vitrified paving brick have had all they could do this past season and they have had a satisfactory price.

The car shortage still continues and in this way the railroads throttle the business of the country with their unpardonable incapacity.

The awakening of the South to the possibilities of the concrete industry has begun in good earnest. Turn your eyes in that direction for a sample of progress next year.

The old time crusher operator finds that he has to learn his business over again in order to take care of new requirements which he is constantly called upon to meet.

The cement manufacturers had a full attendance at the regular meeting of the Association at the Hotel Astor, New York. There was "something didding" every minute.

LIME manufacturers who have given the most study to the point of obtaining greater uniformity for their product, find plenty of market at better prices than they were formerly able to secure.

The splendid revenues derived from office building property in the great American cities is the best guarantee of plenty of money to finance the construction of such buildings in the future.

SEWER pipe manufacturers certainly have nothing to complain of. They have all done a big business. We recently heard of one contract that called for 47 miles of sewer pipe, including the fittings.

It is not always profitable to attempt to do a million dollar business on a capital stock of \$10,000.00. The interest account is likely to eat up the balance which should be on the profit side of the ledger.

The sand-lime brick manufacturers had the usual highly interesting meeting at Chicago, with a good attendance, nearly every operating plant being represented. A full report is printed upon another page.

INTERIOR ornamentation made of stucco is constantly gaining in popularity. There is scarcely a specification for either a modest residence or a palatial mansion, which does not contain some of this really beautiful material.

THE North American Cement Co. was the main topic of discussion among the cement manufacturers and builders supply men at the New York meeting. Happily a full knowledge of the facts as they really exist puts quite a different front to the question.

THE cement brick manufacturer, as well as the concrete block man, realizes that the success of his business depends quite largely upon local conditions, not last among which is the comparison between the price of common clay brick and that of good, clean sand.

THE concrete block and brick manufacturers are at last beginning to learn the three great essentials for putting quality into their product, namely, thorough mixing, sufficient tamping and efficient seasoning. These points taken care of, with good material, success is easy.

THIS is an age of experts, and the tendency is more and more in the direction of employing the most expert methods in all kinds of construction. The man who would succeed in his business must study them and become an expert in his special line if he expects to stay in the lead.

If anybody tells you about mixing concrete so wet that it can be poured to fill the mould just wink your weather eye and tell him to guess again, for if you don't tamp, tamp, tamp, you may have a repetition of the Peoria chimney or the Bixby Hotel incident on your hands.

If all of the people who are advocating the government ownership of the railroads would drop that idea and turn their attention to inducing the government to improve the public highways expressed upon the map by our internal waterways there could be a lot more accomplished and this would bring the railroads around to a realization of what the public requires of them without any further argument. At the same time the expense would be very much less.

ONCE in a while there is a failure of some concrete job, and it is so heralded throughout the country. Bear in mind, gentle reader, that it is never a case of the failure of the concrete, but the failure of the individual who has had to do with the work. His ignorance was too heavy a burden for even such a good structural material as concrete to carry. There has never yet been a failure that would have occurred, had the man doing the work been a constant reader of Rock Products.

THERE is a number of so-called re-inforcing systems which have been found in practice to be very good, but we are inclined to think that it depends a great deal more upon the experience and ability of the engineer in charge than the shapes and sizes of the iron so much talked about by the system promoters. The concrete contractor who knows his business buys his iron by specifications from the steel mill and in this way refuses to pay the system promoters for their fol-de-rol.

THERE are still some manufacturers of the product of the quarry who conduct their operations behind closed doors and mysteriously speak of their private method, which is supposed to be superior to all others. Go to— you are deluded. There are other people in the world just as smart as you, and if a real smart man was to go through your shop, it is quite likely he would not require a lantern to find his way about and show you just how far behind the times you really are. We have seen this happen upon several occasions, and know whereof we speak.

EVOLUTION OF CEMENT.

Concrete Construction of Every Part of a Building From Foundation to Roof Now Possible.

STEPS IN INDUSTRY'S GROWTH.

The best established use of cement and the earliest introduced is the concrete foundation. Even before Portland cement was manufactured in the United States or the present ideas with regard to concrete construction developed, the use of cement for piers, footings and foundations of every description was common. The footings of the famous Bartholdi statue on Bedlow's Island in New York harbor were put in with concrete and so much of it used in this foundation that it practically amounts to a solid concrete pier.

The early builders of the city of Chicago found the foundation problem difficult, as the size of the buildings required a foundation sufficiently strong to carry a heavy superstructure. In the early eighties the leading architects and engineers were wont to say that there was a limit to the foundation possibilities in the city of Chicago and consequently a limit to the size or height of the buildings that it might be safe to construct in that locality. Soon after the pile driving machine was invented and it was found that by systematically driving wooden piles into the sandy soil a firm foundation could be secured and that larger buildings could be safely constructed. In fact, a large number of important buildings of the city are today erected upon this kind of foundation.

At the same time, or even prior to the introduction of pile driving for the purpose of securing stable foundations, the use of heavy concrete piers became popular, and have given more complete satisfaction than anything known to the older systems of foundation construction. When the government let the contract for the new postoffice at Chicago, the old concrete foundation upon which the former postoffice building had rested for a period of upward of twenty-five years, was found to be a monolithic stone, of such perfect texture and hardness, and having such tensile, transverse and crushing strength as to require the adoption of practical quarry methods, of drilling and blasting, to make room for the concrete piers and piers for the new structure which is now occupied as the Chicago postoffice. Chicago is only a type of many other localities where bed-rock lies a great distance from the surface of the ground, for many other cities have the same condition to contend with, and find the same difficulties in securing dependable footings for large buildings.

In the last decade concrete has come to be considered an indispensable factor for every kind of foundation in every locality. In swampy or marshy ground, where wooden piles are soon attacked by worms or bugs so that their usefulness is limited to only a few months, the concrete pile has been found a complete and satisfactory solution of the foundation problem. We know of cases where concrete piles have been driven to the enormous depth of 80 feet before they reached bed rock, but in the end, a perfectly dependable pier, and that is practically everlasting, was secured. In the vast majority of cases, however, it is only necessary to make the excavations deep enough to secure the dry clay strata, which is found from 8 to 16 feet from the surface in many localities, or to carry excavations in sandy places from 20 to 24 feet, of sufficient breadth or tread at the base, to secure the factor of safety to carry the calculated superstructure. Latterly, good practice has brought about the adoption of full reinforcement by the use of iron bars in all foundations so constructed for large buildings. And indeed light reinforcement is put into small concrete foundations for even cottage construction, as well as all kinds of residence jobs. No builder to-day considers that he is doing himself or his work justice unless he is putting under his structure a good and sufficient concrete foundation. The use of cement as a foundation material is now established for all time as par excellence, no matter what other specifications may be decided upon for the superstructure, which is largely dependent upon the available appropriation of money and the taste or opinion of the builder.

Reinforced Concrete Construction

The use of cement for the structural members of tall office buildings has only been introduced

since the birth of the Twentieth Century. When the Ferro-Concrete Construction Co. signed the contract to erect the Ingalls office building at the corner of Fourth and Vine Streets in Cincinnati, entirely of reinforced concrete, there was a sensation in the building world, and old architects and engineers of experience were loath to believe that such a building could be carried "upon mud columns, with mud beams." But when it was further announced that all of the floor spans were to be constructed of reinforced concrete also, the consternation turned into a complete rout. There were many prophecies to the effect that those "mud arches," as the floor spans were called in derision, would break through without warning, and many learned opinions were vouchsafed as to the lack of resiliency in the material employed to accommodate wind pressure and the various other problems which practical builders have known for ages.

As the Ingalls building rose story by story to the height of 200 feet, it was daily, nay hourly, predicted that the whole structure would soon come down with a smash. After this building was completed, before it was turned over to the owners, it was subjected to the most rigid tests that any structure had ever been called upon to withstand. Every beam and every span was tested in detail, to prove a factor of safety far beyond any possible load in the practical use of such a building.

The completion of this building and the record of the tests in detail wiped out all preconceived theory and established the confidence of the public in practical reinforced concrete construction. Now there are hundreds, perhaps even thousands, of similar buildings already completed in the United States, and many are now in course of construction. All of the structural members of such a building are well nigh absolutely fire proof, which qualification alone makes it at least double in value to the builder of any other structural material that he might employ. Such a building requires no fire insurance, for the possibility of fire is excluded in the quality of material selected, and in a period of twenty or twenty-five years the saving of fire insurance premiums will at least pay for half the cost of the building itself.

The cost of reinforced concrete construction, in spite of the enormous advantage over every other known material, which at the time of the completion of the building is delivered at actual value, really is no more, and in most cases much less, than the well known steel case system of construction, or the old time solid masonry with wooden structural members. Then with economy, enormous increase in the value of property, at the same time giving the best guarantee of safety to the contents of the building from fire, as well as guarding the security of human life from the ever present fire danger in every other kind of building, the use of cement for structural purposes in reinforced concrete has certainly come to stay and will grow more deservedly popular as it becomes better understood by the masses.

Concrete Building Blocks.

The concrete building block was introduced about four years ago, and it was at once recognized as a coming building material. So attractive indeed did this new cement industry appear at first glance that many people without practical experience and without sufficient capital, were attracted by the promising returns which they were able to figure out as the possibilities to be secured by the manufacture of concrete building blocks and employing them in all manner of construction.

Again the old school architects and engineers refused to accept the new material, principally for the reason that all of their studies had been devoted to the contemplation of the works of ancient masters of their noble craft, and such study of itself, creates an aversion for anything that carries the name or idea of an innovation. There was another reason. The architect and engineer are men who realize their responsibility to the public, and are loath to recommend any material which has not a well authenticated record of unquestioned excellence as to durability, tensile crushing and transverse strength fully equal to the requirements for which it may be employed. The concrete building block with hollow air spaces, was something entirely new and absolutely untried.

Thus the concrete block manufacturer found himself up against the necessity of acquiring a record for his material, such as would be convincing and acceptable to the masters of opinion in all matters of construction. One of the essential factors of such a record was the element of time. No one could tell anything of the endurance of

such material, and even after reinforced concrete as a structural material had been forced to the acceptance of the architect and the engineer by one brilliant example thoroughly tested, the damp-mixed concrete was considered to be a material with quite a different characteristic. A feature of the Universal Exposition at St. Louis in 1904 was the many creditable exhibits of concrete building blocks made in adjustable iron mouldings machine from the damp-mixed concrete. These exhibits attracted no little attention, and at once they were pronounced by the public at large as a coming building material of high qualifications, and at the same time quite economical in cost.

Unfortunately, at this very time the machines for the manufacture of the concrete building blocks found their way into the hands of incompetent and ignorant parties, who made such indifferent building material as to put the whole industry into bad repute again with the architects and engineers. Still there were capable men who not only turned out a good product, but with their product constructed a large number of creditable buildings of all classes, which commanded the respect of all who saw them.

The industry has had many vicissitudes. Some ill-advised concerns have attempted to conduct the manufacture of concrete building material in localities where suitable sand and gravel can only be secured at great cost and where good clay abounds for the manufacture of cheap burnt brick. A number of such factories were started in localities where the materials for the manufacture of concrete building blocks cost twice as much as fairly good clay brick delivered right at the job. Other concerns attempted to operate with so little knowledge or study of the work that they were attempting to accomplish, that little or no attention was paid to the curing or completion of the product after the moulding process, even if the cement was not "skinned" out of a mixture before the damp-mixed was tamped into the mould, so that a tremendous volume of broken, porous or otherwise imperfect blocks were turned out, diminishing the possibilities of revenue from the product. Such practice could only end in failure, and their name is legion. There is hardly anybody in the country to-day who is not acquainted with, or at least has heard of, some failure of parties attempting to manufacture concrete building blocks. But these failures do not discredit the business by any means, for the cause is too apparent to any one who cares to investigate.

The other class of concrete block manufacturers soon discovered, after they had arrived at the proper equation for the mixture of their material, that the seasoning process could be greatly improved and facilitated by means of tempering or curing the blocks after moulding in an enclosed chamber or tunnel by the application of wet steam. The uniformity of steam-cured blocks was a pronounced step in the direction of perfection, and soon it was found that the product of the factory when equipped with a steam seasoning appliance could be multiplied by five or six times the former volume of output. Besides this the blocks were found to be more dense, especially when a small percentage of perfectly hydrated lime had been added to the mixture.

Another advantage found in this great development was the speed with which the manufacturing process could be completed, for thirty-six to forty-eight hours of steam seasoning was found to secure perfect crystallization of the concrete mass, and this, with one bound, placed the concrete block industry upon a firm, permanent basis from which it will never be moved. The concrete building block so manufactured is the peer of any building material as to its structural qualifications; the face and size and shape of the block naturally being purely a matter of taste and predetermination on the part of the operator. Millions of concrete blocks are now being used for the construction of all kinds of buildings. Some very fine factories, elegant residences and grand apartment buildings are to be seen in almost any and every locality, and now with the help of the architect some of the most attractive buildings are being constructed exclusively of concrete materials.

The concrete block affords an ideal proposition for the curtain walls of reinforced concrete structures. The Oliver Co. at Knoxville, Tenn., recently employed a large number of blocks in this way, and it is one of the most perfect and slightly buildings that the writer has ever looked upon.

Not only in the city has the concrete block won its way, but with the farmer, who finds that he can purchase the blocks and at his leisure construct his own barns or even his own dwelling with a little ingenuity at much less cost than he can employ mechanics to

(Continued on Page 26.)

Concrete Engineer.

An Opportunity for Competent Engineers.

The development of the new science of concrete engineering is taking on more definite form as we learn to understand the requirements and necessities which specifically apply to this branch of construction. The number of men who are giving their attention, time and study to this new branch of structural progress is increasing enormously with each advancing season. There is a demand for hundreds of competent, practical concrete engineers, where one is available. Undoubtedly the principal reason for most of the unsatisfactory, and in some cases, unprofitable operations of concrete establishments is the lack of this indispensable factor to the success of concrete structural undertaking as practiced at the present time.

There is no line of study which can be taken up by the ambitious architect who is best qualified by his educational advantages and rudimentary practice than the great field of concrete construction which is ever widening and progressing at a prodigious rate. There is no class of construction in vogue at the present time which depends so much for its success upon the personal equation of the able superintendents of every detail of the work, as this field.

In reinforced work it is impossible to conceive of anything more important than the care with which the erection of false work should be inspected before the slush is pored in and tamped. No less important is the placing of the reinforcing member with mathematic precision and with sufficient rigidity in the setting to secure the proper imbedding in the concrete. An exact knowledge of mechanical drawing is absolutely indispensable for the concrete engineer must indicate with exactness every detail of the primary and secondary reinforcements, and then train himself to follow the drawings after he has produced them by actual calculation.

The mixture of the concrete mass must necessarily come within the jurisdiction of the concrete engineer, and this requires no little practical knowledge of chemistry and physics. The sand and crushed rock, which constitute from 85 to 90 per cent of the entire mass, should be tested carefully before they are employed upon any important work. This test should not be done in a slipshod or haphazard fashion, but should be made with extreme care.

The sand should be thoroughly sifted out to various approved sizes so that a true knowledge of its nature and physical characteristics may be absolutely known. The same course should be followed with regard to the crushed rock, and both of these members of the concrete aggregate should be known as to their chemical constituents.

In most of the concrete operations heretofore the standard brand of Portland cement which represents nothing as far as the volume of the completed concrete is concerned, and representing only ten to fifteen per cent usually of the original mass of materials, is the only member that can be considered as non-variable in quality, or in other words, the Portland cement could not be a standard brand unless it possessed all of the required qualifications to make it a perfect member of all concrete equations. In making up the aggregate where 85 to 95 per cent of the entire mass is acknowledged to be an unknown quantity the necessity for having absolute knowledge upon this point becomes quite apparent.

The concrete engineer, after he knows the materials which he has decided to employ for any given work, should at once proceed by actual test to find out just how much cement is necessary to completely fill the interstices, and then by allowing a small percentage beyond that developed with the material so tested as a factor of safety, he can have the positive knowledge of correct proportion. There is no other way by which to reach such an equation that can be relied upon.

The arbitrary one-two-four, or one-three-five of some of the superficially informed chief engineers and general contractors will not do at all, and can not be depended upon in practice, except that usually the factor of safety is very high and a large amount of cement is thereby specified beyond what is necessary or useful, thereby entailing considerable waste. On the other hand under such specifications the practical man soon comes to realize that the specified amount of cement is more than necessary, and this gives him a tendency to "skin" the job. This tendency is often carried too far, and sometimes results in failure.

It is the business of the concrete engineer to reduce concrete construction to the same mathematical exactness as steel and brick construction; to prepare his plans and specifications in such a way that any builder can read and follow them without deviation, and thus obtain the infallible results in every detail desired and figured out in advance.

An architect's education is indispensable to the concrete engineer who expects to be a success in his profession, as it is not only necessary for him to be familiar with all the stresses and loads of column and beam and girder and span for the erection of reinforced work, but he must be acquainted with the intrinsic characteristic of concrete itself. He must understand from his own experimentation that the water which is put into the slush at the time of mixing is almost sure to be an over-supply, and that only by tamping out this extra water so as to leave merely the amount required in the process of crystallization, shall be insured the formation of such a concrete as may be depended upon to develop the calculated tensile crushing and transverse strength. He must learn by practice or careful observation the importance and best practice of careful tamping, and learn to maintain rigid uniformity of the proportions of the various materials which enter into the concrete mass. In fact, his knowledge of concrete by what is known as the wet mix must be complete and thorough, and he must be prepared by experience to put such knowledge into efficient practice.

Besides all this, it is necessary for him to have a complete knowledge of the damp-mix branch of the concrete industry, which nearly all of the concrete engineers practicing the profession today are inclined to overlook, or hold in contempt on account of a number of reported failures that were recorded against some early ignorant operators in this especial line. The damp-mix concrete branch is steadily growing in importance, and on account of its almost unlimited adaptability to the molding process is destined to become an indispensable factor in almost every structural calculation. The light, hollow concrete block, when properly molded, tamped, seasoned and water proofed, offers at once the most economical, as well as the best available, material for the construction of curtain walls for buildings whose structural members are built of reinforced concrete. The development of ornamental molds for architectural trimmings has increased to a wonderful extent this past year so that lintels, caps, water tables, and belt courses, corner quoins, and keystones for arches are pretty sure to be specified in conjunction with brick work as fast as they become better known.

Then again the concrete block and the cement brick in some localities at least, where the material for making them are to be had cheap enough, are fast becoming the standard building material, and where they are properly made they have such high intrinsic structural value that there is no chance of eliminating them out of the calculation of the consideration of builders.

Our Information Bureau.

We realize that the ambitious concrete engineer is frequently confronted with the problem of securing information, and securing it quickly, too, upon matters which he finds he has to deal in the course of his work. One of the principal excuses for our existence as a trade paper is to be in a position for the dissemination of knowledge. We have a great deal of information on file arranged in such a way that it can be conveniently passed along to the men who need it the most in their every day work. Of course the reader will readily recognize that it is impossible for us to repeat with every issue of the paper all of the information that we are constantly developing so that the current issue may not chance to have just what the engineer needs. For this reason Rock Products has established an Information Bureau which is free for the use of those who wish to avail themselves of its advantages. The only thing re-

quired is for the question to be stated in such a way that all the surrounding circumstances or corollary conditions are provided for so that a distinct understanding of the question may be arrived at. If a complete answer can be found in our file it will be forwarded promptly, but if there is any doubt as to the reliability of the implying the information, which, we are willing to take the necessary steps to secure the most expert and practical advice obtainable before supplying the information, which we are willing to guarantee in every instance, will be the best to be had at the time when it is furnished without regard to location or expense in obtaining it.

Of course such an offer upon the part of a great newspaper has the effect of inviting the wag element of the craft to cook up puzzled questions which have no answer, which are of no positive value in practice, and concerning which it is very well known that there are two or more well established contending opinions. Of course no attention will be given to such questions by our Information Bureau when this character is apparent upon the face of the query.

Our object in making this suggestion is to assist in every possible way in the up-building and advancement of the great concrete industry as a whole by spreading the gospel of information where it is most needed to the limit of our ability, and to this laudible purpose we invite concrete engineers, however employed, and wherever located, to make as liberal use as they desire of the Rock Products' Information Bureau.

Grand Rapids Building Laws.

The City of Grand Rapids, Mich., recently passed a building ordinance which wisely makes provision for the official inspection of all concrete construction in that city, according to the rules and specifications provided. The ordinance provides for the testing of every kind of building material, among which both concrete block and concrete brick are recognized upon a fair footing with other standard building material. The ordinance specifically provides that all concrete used in Grand Rapids shall be mixed with an approved mixing machine, in this way providing for the making of a concrete which has proved in practice to be a satisfactory product. Another provision of the ordinance requires that parties, when applying for a building permit, shall submit samples of the material and the formula of the concrete mixer to be used on the job, if any, to be deposited with a complete set of drawings and specifications, giving all the details of the work for the consideration of the official building inspector working under the authority of the city council. The ordinance taken as a whole is a good one and might well be copied, or at least used as a model by other cities now unprovided with any modern protection of this character.

Chair of Concrete Engineering.

The most astonishing feature of reinforced concrete as a structural material is that it is actually cheaper than a steel frame, and even solid masonry construction in most of the larger cities, where the bricklayers' union reigns without interruption. When one thinks of the enormous expense of centering all of the columns, beams and girders, consuming fully 60 per cent of the entire contract cost, it looks as if this enormous waste could be saved in some way. Where is the inventor who will come to the front with a collapsible centering mould in labor saving or adjustable sizes which will do away with a large percentage, at least, of this awful drain upon the building appropriation.

Mr. Edison's suggestion along this line, although quite impractical, is a lead in the right direction. His plan is to make a complete mould or set of moulds, for a given job, set it up upon a foundation already leveled, and inject the slush with force into this mould, then set the same mould up over and over again; in this way repeating the same house, an indefinite number of times, somewhat after the manner of duplicating sheets from the same form upon a printing press, or to be more exact, like moulding a large number of brick exactly alike by using the same mould. Since the University of Syracuse has established a Chair of Concrete Engineering, in due course of time there will likely be a large class of technical men graduated from that institution, with a large store of theoretical knowledge upon the subject of concrete, and starting with such a foundation they should by all good processes of reasoning, be developed into concrete engineers of high attainment.

The Architect in Concrete Construction.

Aside from the prejudice of the general public against anything new two of the greatest obstacles that concrete has had to surmount in order to reach its present position as a building material have been the unwillingness of some architects to give up old methods of construction and the plasticity of the concrete itself, or to express it in other words, the elasticity of its form. This statement as far as the naming of the second obstacle goes may be deemed a contradiction in itself, but what should have been an aid in the advancement of the concrete as a building material, that is its plasticity, has in reality been a detriment. This, of course, through no fault of the block itself. But some architects, adhering closely to the old forms of construction, have, when called upon to draw plans and specifications for a concrete building, drawn the plans as if they were for materials in which he has been working and tried to make the concrete blocks fit. If he were an architect who has been drawing plans for frame houses he would probably draw the same old plans when called upon to design a residence of concrete blocks. If he were an architect who was conversant with stone construction or brick construction he would probably draw his plans for a concrete block house along the old lines. In other words he has made the blocks fit the plans instead of drawing the plans with his material and the best form in which it may be used for a given purpose in view. And because of the plasticity of the material, by reason of which it could be used successfully as a substitute for stone or brick or frame construction, this slipshod method has been possible. No originality has been required and all the architect had to do in designing plans for a dwelling and all some did, was to "rehash" some of his old plans. He failed to take into account the fact that concrete is a material in itself and while it lends itself admirably as a substitute for stone, brick or frame construction it is something more than a substitute and is capable of being used in a varied number of forms. While he has taken advantage of its plasticity in using it as a substitute he has through prejudice or ignorance or shiftlessness frequently failed to take advantage of its plasticity in molding new and original designs. And thus its plasticity has been an obstacle in the way of concrete construction.

Of course to such general statements as these there are always exceptions and that is true as regards architects. There have been and are today architects who have realized the possibilities of concrete and concrete block construction and have devoted their energy and time to designing forms that will appear to the best artistic and architectural advantage. There are some, not of the shiftless kind, who are not content to follow old forms, which we have borrowed from the Greeks or from the Egyptians or from the Renaissance period or from the Gothic types and who are willing to try their own inventive genius and give expression to their own originality in designing forms for the material with which they are dealing.



SHOWING PLEASING EFFECT GAINED BY USING WATER TABLE AND DIFFERENT FACES OF BRICK.

And what a wonderful material they have! We have no more plastic building material to-day than concrete. It can be moulded into any form or any size that may be deemed necessary. Most beautiful and inexpensive results can be obtained from it even when imitation is the chief characteristic of the designer. It has lent itself to reproduction of many attractive ornamental designs of all ages. Columns, capitals, pilasters, statuary and any form of ornamental architecture can be made from it. If even there were the opportunity for a genius to put his originality into some lasting form, as did Michael Angelo, Raphael or the great sculptors and builders of all times, that opportunity seems to be offered in the twentieth century era of concrete construction.

Be it said to the discredit of the architectural profession that some of its members far from seeking to take advantage of this great opportunity have wilfully thrust it aside either through prejudice or ignorance or shiftlessness. In some cases perhaps architects have purposely done slovenly work in designing buildings of concrete construction in order to give the industry, against which they were deeply prejudiced, a "black eye." Whether their poor work has been wilful or only careless the result has been the same. Concrete construction has received a "black eye" in some instances from the very buildings in which it has been used.

Now a careful artist in designing a building in which stone is to be used as the main facing material or the main ornamental material specifies exactly the number and the size of the blocks of stone that he wants to use. If he is using a varied assortment it is part of his work to specify and indicate the exact faces, sizes and shapes he wants. A good architect does this and does not leave the question of filling spaces to the wisdom and artistic taste of the mason. But when we look at some of the houses of concrete blocks we can not help but think that the architect drew the plans for the house specifying only the kind of blocks that were to be used with no thought apparently of the different faces and sizes that were to be used. Thus in some cases we find along side doors that blocks have been used as if the mason picked up what were left over and shoved them in to fill the open spaces as utility alone demanded. We see bad breaks and in some cases blocks on one side of an opening laid vertically and on the other side laid horizontally. It is such cases as these that have given the industry a black eye.

As far as durability goes concrete construction is on a firm footing. It has been demonstrated by numerous and severe tests that as a building material it can not be excelled for strength and durability. It has stood the test as far as that feature is concerned. It only remains for the architects now to win the public over by producing forms that appeal to the aesthetic sense. Many objections, real or assumed, have been advanced against concrete construction on this score. We hear a person say that a house built of concrete blocks gives the appearance of being a prison. We hear another person say that it "looks dead." We hear another say that the house is "bare and staring." We hear another say that the house fails to give the appearance of being substantial. Now all these objections can not be traced to any defect in the blocks themselves or in the majority of cases to the method by which they are made but rather to the manner in which they are used. As we have said before the architect has not drawn his plans with his material in view. He has drawn his plans with something else in view, trusting to luck or to the common sense of the mason that the "thing" would "look all right" when finished. Now it is not the province of this article to dictate to architects what they should or should not do but a few suggestions from a layman may not be out of place as indicating what faults in design he has observed.

Frequently we see a residence built in which the same face block is used from foundation to gable. This has resulted frequently in the "dead" effect. In other cases where the natural stone face has been used the result has been the same because the edges of the blocks have in many cases been dull instead of sharp. If the architect desires to give the impression that the building is of stone he should use blocks with sharp edges. Not only this but it would be well to have different faces for the blocks. If the house is constructed of blocks with the same face a casual glance would not be pleasant to an artistic person and his aesthetic sense would be irritated although perhaps he

would be unable to state definitely where the difficulty was. But let the blocks have five or six different faces and the natural stone effect would be heightened. Of course it is useless to suggest to competent architects that in many cases blocks should be used in the foundation with a different face from those used in the walls and that he might relieve the "bare and staring" or the "dead" effect by using a watertable to indicate a division between the first and second story and a different face or a smooth face, where rough face is being generally used, to indicate where the second story ends. The architect should remember that the material with which he is working can be molded into almost any form and that he can embellish his design with columns or pilasters or any new forms. He can thus get rid of the bare effect that blocks of the same face give. By exercising a little originality he can produce a design of great attractiveness.

Of course the architect in concrete construction knows that he can have his blocks made to order and he should give such specifications as he would for stone were that material to be used in construction. He should know exactly the different shapes, sizes and faces of block needed and these should be manufactured just as he has ordered them. All short pieces should be provided for and all bad "breaks" should also be given attention so that the general effect may not be spoiled by the mason using what he has left to fill openings. The architect should remember that he is dealing with a very plastic material, that is not a substitute, although it may be used as such, but is a material itself deserving of a special design adapted to itself in construction. It is possible that an architect may be born or developed within the next few years who will produce a distinctive form in which concrete construction may be used and give us a distinctive American type of architecture by means of this typically American material so that we may no longer have to depend for our style on the Grecian or Italian or Gothic or Renaissance types. Let us all of one accord say "speed the day."

In the two pictures of residences presented on this page can be seen good and bad points in their architectural features and we believe there is no one who would hesitate as to a choice of the two if he were guided solely by their artistic points. Note in the one the effect of repose and dignity given by the use of the water table about the foundation and the belt course that marks the beginning of the second story. Note also that in the choice of blocks ashlar blocks have been used with good effect in the second story courses. The general effect of the building is pleasing. The other building has that "bare and staring" effect, of which we have spoken. Three faces of block have been used, one heavy face for the foundation, another for the courses and another face for the extension on the side. But there is not enough contrast between the foundation and the courses and the latter to present a monotonous appearance. Especially is this true in the bare space between the porch and the tower. The side of this house also gives the "prison" effect, which might have been avoided by the use of a water table and wider frames for the windows. These two buildings have been selected because their general architectural lines are similar and the contrast is strong enough to indicate the purpose of this article. And that is to urge that more attention be given to the architectural and artistic features of concrete construction.



SHOWING "BARE AND STARING" EFFECT DUE TO FAULTY ARCHITECTURE.

From Our Own
Correspondents.

SYRACUSE, N. Y.

SYRACUSE, N. Y., December 15.—With the arrival of cold weather outside building operations have ceased and the market is somewhat duller than it has been in a long time. Inquiry among the architects reveals the fact that preparations are being made for an exceptionally busy spring. Shipments of material into the city are being seriously delayed by lack of cars.

The Chamber of Commerce held a meeting recently for the purpose of encouraging working men to build and own homes of their own. Invitations were sent out to all of the builders, contractors, real estate men and a large number of working men who it was thought might be interested and facts and figures were set forth by the Home Ownership Committee of the Chamber of Commerce showing the advantage to laborers of building homes for themselves and to capitalists to erect moderate priced houses which they could rent to working men at a reasonable price and still realize at least 10 per cent on their investment. It was shown that rents have advanced to such an extent that in spite of the increased cost of building material it is still profitable to build houses.

George W. Pack & Son, who bought the machinery, formulas and business of the Adamant Plaster Co., have also bought the patent wall plaster business of the National Wall Plaster Co., which was located in the Canal Street factory. This is simply a branch of the business of the National company and the sale of it does not interfere in any way with its other business which is conducted at the mills and quarries east of Syracuse. George W. Pack & Son have the plant running. The shipping facilities of the building in which the Packs have located their plaster industry, is excellent as the building is located between the canal and the railroad.

The most absolute fire-proof building in Syracuse is the new 5-story plant which is being erected by the Concrete Steel and Tile Co., of Detroit, and W. J. Burns & Co., of Syracuse, for the Brown-Lipe Gear Co. This building is entirely of concrete and steel. Manufacturers of automobile parts like this concern are confronted with the necessity of having a building which can not burn down. The Brown-Lipe Co. supplies a number of the largest automobile manufacturers with gears and if their output should be stopped for any reason, it would necessarily mean the closing of the automobile factories. The new factory will cost about \$100,000.00 and 500 men will be employed. It will probably be done by March 1.

The prospecting for gypsum carried on by E. B. Alvord Co., near Jamesville has not met with success. Three holes have been sunk and the fourth is now being put down. Maanger Harry Conklin is not discouraged and says that such things are in the game.

The City of Watertown is to build a trunk sewer costing about \$80,000.00.

Contracts for the erection of the \$300,000.00 fire-proof apartment building for the Leavenworth Apartment Co., have been let as follows: Steel and re-inforced concrete to the Syracuse Bridge Co.; masonry and carpenter work to Heffernan & Son, of Syracuse. The contracts call for the work to commence immediately and the enclosure of the building May 10, 1907. The building will contain 60 apartments and all modern improvements. The exterior will be covered with pressed brick, stone trimmings and Spanish tile roof. A large amount of marble will be used in the corridors and baths.

AROUND BUFFALO.

BUFFALO, N. Y., December 15.—A creditors' petition in bankruptcy has been filed here by Rochester, N. Y., creditors against the Cement Products Co., of that city. The total amount of claims filed aggregates \$6,616.47.

The act of bankruptcy alleged is that the directors of the company, December 10, caused a petition to be filed in supreme court alleging its insolvency, and asking that the corporation be dissolved and that a receiver be appointed. It is also alleged that the company has been insolvent since last September, and that since then it has paid out to creditors large sums of money.

The total indebtedness of the corporation is placed at about \$10,000.00 and its assets at less than \$6,000.00.

The plant of the New York Cement Co., at Randout, N. Y., was destroyed by fire yesterday. The loss is estimated at \$250,000.00. As a result of the fire 200 men are out of work.

A concrete and brick building is to be erected by the McKinnon Dash Co., in Ontario Street, Buffalo, at a cost of \$17,725.00.

The Charles A. Drescher Co. has filed a certificate of incorporation in the office of the County Clerk, Buffalo. Business will begin with \$2,000.00 of the capital stock of \$10,000.00. The business is to be the manufacture of building stone and concrete. Charles A. Drescher, Thomas L. Saltarelli and Julia Drescher are the directors.

Merrill W. Milks has filed plans for a two-story concrete and frame house at 1314 Abbott Road, Buffalo, to cost \$3,435.00.

Superintendent George W. Goble has completed the construction of the west concrete pier at Charlotte, N. Y., along Lake Ontario. The new pier is being built in heavy cribs filled with stone. On the top of these cribs is a layer of concrete, four feet in thickness and on this is a surface layer of blocks of concrete twelve feet square.

This concrete pier has been rebuilt from the shore line of Lake Ontario near the ferry landing at Charlotte, a distance of 1,500 feet, where it connects with an old pier on which a light house stands. Over the new concrete pier an elevated steel walk has been erected. A section of the east pier 240 feet in length has been rebuilt of concrete at Charlotte. There remains about 1300 feet of this concrete structure to be built before the shore line is reached, but Congress will have to make another appropriation before this work can be done, as the government appropriation of \$80,000.00 has been exhausted. In the construction of the west pier it is estimated that 6,600 bags of cement were used for the concrete work. All the stone used in the concrete and crib work was obtained on the shore of Lake Ontario.

CLEVELAND AND NORTHERN OHIO.

CLEVELAND, OHIO, December 15.—In considering territories which are forging to the front in both the use and production of concrete and other manufactured rock products this city and vicinity must be remembered as an important factor. Cleveland, a city of half a million, the seventh in the Union, is setting a pace in concrete construction which will put other municipalities to shame. Scores of buildings, consisting of dwellings, stores, office and hotel structures and factories have sprung up within the past year and have been received with general satisfaction on every side.

As a manufacturing city Cleveland stands to the front. Over a score of concerns are engaged in concrete construction work, while the firms handling cement, lime, sewer pipe and other manufactured products are numerous. Having all the necessary ingredients at hand, including vast supplies of sand and stone, it is only natural that concrete work should meet with favor. Cleveland, the half way point between the coal fields of Pennsylvania and Ohio and the iron ores of Lake Superior, has found that it needed concrete and cement in its business and that is the reason that on every hand may be seen firms responding to new ideas in construction whether it be a floor or a factory.

The Kelley Island Lime and Transport Co., which is one of the largest corporations of its kind in the country, has had a season of success. Despite the fact that new machinery has been installed at the various plants and the fleet of eight vessels operated to the limit, the demand for lime,

sand, crushed stone and other material has regularly exceeded the supply.

Fifty cars a day of lime has been the average shipped from the Marblehead, O., plant of the company while fifteen cars a day has been a fair average for the plant located at White Rock O. Work has just been finished in doubling the capacity of the White Rock plant, and the new kilns have stood up nicely under the fires which were placed in them early this month.

The demand for good sand, both river and lake, has been unprecedented. The company claims that the river sand, which is raised from the river beds with hydraulic suckers, is of a sharper and better variety for concrete and cement work than the lake sand, which is also in great demand, however. The company has a capacity of nearly 700 tons of sand a day and has a constant demand which exceeds the supply.

Fifty tons of plaster are being turned out daily at the Columbus road plant of the Kelley Island company and this is sold as fast as manufactured. The demand for crushed stone is heavy. One day during the past season the company made shipments of 7,000 tons and for weeks at a time the amount turned out nearly reached that figure. The concern is at present installing a No. 10 Gates crusher, which it is claimed is as large as any crusher ever made. The fleet of eight boats owned by the company is kept busy night and day carrying material from the base of supplies to the various markets. Officers of the company say that the various plants will be kept running full blast all winter, not only to supply the ever increasing winter demand but also to stock for the rush which is expected early next season.

Officers of the Struthers Furnace Co., which makes cement from furnace slag, having a capacity of 1,000 barrels a day, say that the demand has been remarkable this season and that it is constantly increasing. The price has advanced in this section twenty per cent in the past few weeks because of the inability of the cement companies to meet the demands made upon them. This has been by far the biggest year in the cement business in Cleveland and Northern Ohio and the outlook for 1907 seems very rosy.

The Cleveland Concrete Block Co., through its local manager, R. W. Russell, reports that the demand for cement building block is increasing by leaps and bounds and that never has cement block building been considered so favorably as at present. The concern has a capacity of 1,000 blocks a day and can not keep up with its orders. It is planned to run the plant all winter to fill orders already in and to stock up for next season. In this locality, despite the cold winters, cement block is being laid with great success, even in the coldest weather. The Cleveland Concrete Block Co. has adopted the H. S. Palmer patent for making blocks and uses the Medusa waterproof compound, made by the Sandusky Cement Co., to waterproof its blocks. It is claimed that this compound makes the blocks impervious to water. The concern is also making an attractive fluted column from concrete, which is meeting with a heavy sale.

The car shortage is proving a serious problem for cement and building supply men in Cleveland, declare wholesalers in this city, who are unable to receive shipments because they are held up in transit. This applies particularly to cement and crushed stone, which must be shipped into the city from outside points.

A season of success has been experienced by the Carey Construction Co., with offices in the Electric Building. Some fourteen structures of concrete have been erected during the past year, involving contracts reaching a half million of dollars in value. Most of the building has been done in Cleveland. The company uses the Carey method, that of round steel rods embedded in concrete. E. J. Ferguson, engineer for the Carey Co., in discussing the occasional collapses of structural cement work, declares that eighty per cent of the efficiency of such work depends upon the selection and grading of the materials used and the supervision exercised over their mixing. The company designs and erects all its own work, using some 40,000 barrels of cement each year.

The Carey company has a very unique method of construction which enables it to continue concrete construction all winter. Materials for a building are all heated before being used. The water used is brought to a boiling point by steam and then used in mixtures. Salt is thrown into the mixture to keep it from freezing. The stone and sand are thoroughly heated and even the

tools are warmed in the cold weather before they touch the concrete. Paper, canvas, and even manure are used to keep the new work free from frost until it sets. The Carey company started a large building on Prospect Avenue January 1 last and had it completed in three months, working through the dead of winter. Another similar contract is now being prepared for, the company having a contract to erect a four story concrete school building at Tod and Forman Streets, Cleveland. Cold weather has no terrors for this firm. Only one small section of the building put up last winter was nipped by frost, but when spring came that, too, hardened, so that a pick could not break it.

The Cleveland Fuel and Supply Co. has had a successful season, according to Manager Dittoe. The firm is agent for the Empire cement and heavy sales are reported. Difficulty has been experienced by the firm in securing shipments of crushed stone from Bellevue, O., where three large firms are located that dispose of considerable of their product in Cleveland.

For the month of November all building records in Cleveland were shattered. Permits numbering 661 were issued, involving buildings costing \$808,027.00. Of the total forty-nine were for stone and steel structures costing \$260,000.00. A year ago 346 permits were issued, representing a value of \$680,000.00.

Within the past two years cement walks have come into particular favor in Cleveland. This city being in the heart of a vast stone district, the flag stones were in great demand for walks. Difficulty of handling these and the occasional breakage has caused a sentiment in favor of cement walks and long stretches of them are now appearing in various parts of the city.

Concrete work for bridges and culverts is also replacing stone. Several railroads having their division offices here have instructed their engineers to use that form of construction in preference to huge blocks of stone.

Building of concrete block houses is progressing in Cleveland, even with the approach of wintry weather. It is pointed out that less mortar is used than with brick and that everything else being equal the concrete block structure is apt to be even a more substantial one than the brick building erected during the cold season.

The gravel industry in Cleveland vicinity has reached an enormous proportion. Being on the shore of Lake Superior gravel abounds in large quantities and many men are employed in getting it ready for the concrete market, some persons preferring it to crushed stone for certain lines of work.

A fine grade of artificial stone which can scarcely be detected from the real article has been supplied for the construction of the new Majestic theater, Cleveland, by Geo. Rackle & Sons, with headquarters on Superior Avenue and E. 32nd Street. The prejudice against artificial stone has almost entirely disappeared in this city and the product furnished for the facade of the new playhouse is very attractive as well as useful. The company making it claims that it is fully as substantial as stone, of as good a color and that it requires the services of an expert to detect it from the genuine. The theater is constructed of concrete and is fire-proof. The concrete work has been done by the Masters & Mullen Construction Co., 856 Rose Building, Cleveland. It is noticeable that three theaters under construction in Cleveland call for the use of re-inforced concrete throughout.

The Cuyahoga Concrete Stone Co., with a factory at 2561 E. 89th Street, is running to capacity, turning out about 900 building blocks a day. The managers claim that the blocks can not be made fast enough to meet the demand. A line of artificial stone is also manufactured. The company contemplates enlarging the plant next spring.

J. W. Kling, of the Cleveland Builders' Supply Co., reports an active season in all lines of building material, though it is slackening up owing to the approach of winter. The demand for cement Mr. Kling declares, has been excellent. Lime has also been in demand. The concern's new plaster mill, one of the largest of the world is almost finished. Plaster has been in great demand during the season. Repairs to buildings and plant will now be in order, though a quantity of stock will be turned out during the winter season.

LOUISVILLE, KY.

LOUISVILLE, KY., December 20.—With Christmas only a few days distant, snow on the ground and real winter having set in, there is of course a slight lull in building operations, but concrete work shows no signs of cessation or let-up, nor is it likely to.

Robert Morris, of the Central Concrete Construction Co., reports business booming in the line of concrete block work. Their present work consists of residences on Hill Street, near Fourth, Sherwood Avenue, Beechwood Avenue and other sections of the city. Estimates are also being made on five or ten other buildings in the city.

Mr. Morris is now arranging to increase the size and capacity of his plant in order to meet the demand for his product which is increasing daily.

Of course all the buildings in course of construction, both residences and office buildings, require plaster, and the close of the year finds the Kentucky Wall Plaster Co. busy, which is a usual condition of affairs with this enterprising firm.

J. B. Speed & Co., 333 West Main Street, through Henry Gray, advise that while business is naturally quiet at this time, they have not been able to stock up at all, but are marketing every barrel of Portland cement and natural cement they can make. The work of construction for addition to their Portland cement plant is under way and part of their machinery has been ordered.

At the plant of the Louisville Pressed Stone Co., Fifth and A Streets, John E. Simon is busy in overhauling and extending the plant. He has already installed Winget concrete block machinery and is arranging to have a tunnel built for the purpose of curing his blocks and concrete work by steam. The work contemplated is quite extensive, but when completed, the Louisville Pressed Stone Co. will have a model plant in every particular.

The Ohio River Sand Co., through J. M. Settle, reports business moving steadily and satisfactorily. It was inadvertently stated in the last issue that this concern could not take at that time any additional orders. We certainly hasten to correct this statement, for certainly with a plant of the size and with the equipment that this concern has, they can always make deliveries, no matter how busy.

Neil Monks, of the Southern Roofing and Paving Co., advises that his various departments are working like beavers to try to finish up all their contracts before the first of the new year. The roofing department is especially busy, but there is no particularly large jobs, other than those mentioned last month.

The National Concrete Construction Co. is full up with work, both in and out of town. In addition to furnishing up the work they already have, a contract has just been secured for considerable depot work for the L. and N. railroad at Frankfort, Ky. They have just finished a large job at Ettowah, Tenn. The power house for the City Railway Co., sinking a large well for the Louisville Lighting Co., at Fifteenth and Magazine Streets are among the newest work which Mr. Webster Gazley, the chief engineer of this busy company, reports.

MEMPHIS AND THE SOUTHWEST.

MEMPHIS, TENN., December 19.—All the cement, lime, and building supply houses in Memphis are doing a first class winter business. The fall trade, Rock PRODUCTS' correspondent is informed by the contractors and supply firms, was a record breaker in Memphis' history. This is nominally the quiet season, but trade's passing good now—the prediction from the most conservative factors is that the spring volume will be extraordinary. Memphis is apt to see a new era in artificial stone and concrete work in the next two years. Several firms are now getting their bearings along this line for larger work.

At the plant in North Memphis of the Cubbins Lime and Cement Co., your correspondent was informed to-day by Edwin Frazier, of that firm, that the 1906 trade of this house had been very satisfactory and with many office buildings, a million dollar courthouse and hundreds of residences already under plan by local architects that the anticipations were for an early and heavy spring trade in 1907. This firm is located with its

warehouses along the Louisville and Nashville railroad at Brinkly Avenue. All of its supplies are received by rail. The warehouse is 212x50 feet and it is always kept full. The firm has the sole agency here for the U. S. Gypsum Co.'s products.

The Memphis Hydraulic Stone Co., at great expense, has perfected its facilities for artificial stone work and will go into the industry extensively during 1907. Steve Wright is president and manager of the company.

Steve Wright is also one of the veterans in the supply trade, handling brick, lime, cement and other goods. His office and ware-rooms are on Hernando Street. Mr. Wright, like most of the Memphis supply men, receives his supplies by rail. He carries sand from the Mississippi. He handles the Pennsylvania cements, St. Genevieve lime, patent plasters, agatite, etc. Mr. Wright said:

"Business is fairly good this winter, from large contracts and general work. Supplies have advanced from the manufacturer to the jobber by from 10 to 12 per cent. The jobbers have hardly been able to advance under the stress of hard competition."

The Memphis Asphalt Co. is filling up a large number of repair jobs on the streets here made by the conduit works of the Merchants' Power Co. The Asphalt Co. will also commence the asphalt work on Poplar Street. Citizens have subscribed \$20,000.00 for the work.

The Selden-Breck Construction Co., of this city and St. Louis, has the contract for several concrete buildings in New South Memphis, to be built for the American Bag Co.

The Chas. R. Miller Co., of this city, is doing some concrete work on the Tooney Building at 301 and 303 Madison Street.

E. G. Thoma contemplates the establishment of a cement building block factory at Boonville, Mo. The factory will be in operation by spring. Mr. Thoma has been doing various classes of cement work for some time, making cistern tops.

The Panhandle Brick Manufacturing Co., of Canyon City, Randall County, Texas, has been incorporated with a capital stock of \$75,000.00 for the purpose of making brick and tile. The incorporators are: Chas. Berner, A. Walker and L. W. Walker.

R. L. Ingram, of Midlothian, Tex., and D. L. Joynt, of Gonzales, Tex., will establish a brick making plant at Midlothian on the Ft. Worth branch of the Central. The company will have a capital stock of about \$40,000.00. The gentlemen named are now in Ohio looking after machinery purchases for the plant.

The Fort Worth Glass and Sand Co., of Fort Worth, Texas, has been organized with a capital stock of \$50,000.00 by Frank Watson, Henry Watson, E. S. Hills, U. S. Johns, Wm. Linden and J. S. Breathwit.

The Cherokee Press Brick Co., of Tulsa, I. T., has been purchased by a new company organized at that point. The new company has a capital stock of \$50,000.00. The officers are: President, C. H. Hancock, of Seymour, Ind.; vice president, A. T. Arnett, of Pawnee, Okla.; secretary, J. W. Anthony, of Seymour, Ind.; and J. F. Kirkpatrick, of Tulsa, I. T.

The Salina Cement Stone Co., of Salina, Kan., has put in some new machines for the making of 8x12 inch blocks. I. C. Henry is manager of this company.

M. G. Koontz, field manager for the proposed central cement company's big plant at Crane Station, near Independence, Kan., states that the plant will certainly be built. The company has been fully financed, he says, and the factory will be a duplication of the Table Mound plant, or nearly so. It will have two rotaries and will employ 600 men.

The Kansas cement manufacturers have orders beyond capacity. The Iola (Kan.) plants are turning out 9,000 barrels daily.

The Union Portland Cement Co. that is preparing to build a factory at Iola, Kan., has established head offices in the New York Life Building, in Kansas City, Mo. The office will be in charge of Richard C. Patterson, manager of the company. The company will establish an office in Iola in the Stevenson Building. John Wakefield, secretary of the company, will be the head of the Iola office.

The American Cement Plaster Co. has begun the erection of an addition to its big mill at Watonga, Okla. The addition will be 45x110 feet. In addition to this the company will erect a new cement mill one block east of the present mill. The new mill will manufacture what is known as Keen cement, for finishing purposes. This is one of the largest plaster mills in Oklahoma.

IN THE NORTHWEST.

MINNEAPOLIS, MINN., December 16.—The Northwestern Concrete Products Association is preparing for the annual convention, which is to be held in St. Paul, January 16-18. George A. Hughes, the secretary, has resigned owing to his business taking him to the South and Martin T. Roche, of St. Paul, succeeds as secretary. A meeting of the officers and directors was held November 24, at which preliminary arrangements were started for the convention. The meeting will be held in the new Auditorium building, just being completed. The association decided to extend to the architects of the Northwest generally, an invitation to submit designs and photographs of notable work of theirs in cement, or any nature whatever, from the laying up of a brick wall in cement, to the construction of buildings of concrete blocks or of monolithic construction. These drawings and photographs are to be prominently exhibited in the hall, with full credit to the architects. The expectation is that the convention this year will have a larger and better attendance than in either of the previous conventions.

The Missouri Slope Brick and Tile Co. was recently incorporated at Dickinson, N. D., with \$35,000.00 paid-in capital. A dry press plant is being installed and the company will proceed to engage in manufacturing for the early spring business. The output will include select common facing brick. K. A. Kahnon is general manager of the company.

David Stretch, of 171 Cedar Lake Road, Minneapolis, is the Twin Cities representative of the new Wisconsin Portland Cement Co., of Portage, Wis.

F. Leutz, of Hahon, N. D., has returned home after an extended trip in Germany, investigating the manufacture of clay vessels for chemical containers. His investigations convince him that the clays available in that vicinity are suitable for not only all such vessels, but also for the production of chinaware and pottery.

The Minnesota State Agricultural school at St. Anthony Park, between St. Paul and Minneapolis, has added to its course, work in concrete construction. Students are taught the proper manner to mix cement, of handling concrete for making walks, cellar floors, retaining walls, cement posts, cement water tanks, silos and foundations. In fact, everything that is likely to be used on the farm, of cement, is to be included in the work.

The National Stone Manufacturing Co., of Minneapolis, have their new factory building nearly completed at Central and Fillmore Street, Northeast, and are turning out a superior class of cast cement stone. These stones are made in any form and size desired, and of any tint or color. Special designs are made from architects' drawings, the same as terra cotta. The new congregational church at Glenwood, Minn., which J. H. Olson is building, on plans from A. F. Gauger, architect, of St. Paul, is using this block for the basement and trimmings. This stone has the appearance of granite and costs less than stone.

George W. Higgins, president of the Minneapolis Brick and Tile Co., was elected to the Minnesota State legislature from his district. Mr. Higgins is a consistent prohibitionist, and was one of the four prohibitionists to succeed at the late election. C. J. Swanson, of the Northwestern Brick and Fireproofing Works, was also elected to the legislature, from his home at Fridley, Minn. Mr. Swanson is a Republican.

J. V. Godfrey, of Moorhead, Minn., recently completed a large amount of cement work for L. A. Huntoon's dairy farm near that place. There were 340 feet of mangers constructed of cement, with a trough three feet wide and two feet deep. These are continuous and arranged so that water can be run through for watering the stock, and after they drink the mangers are drained and feeding done in the same manger.

The plant of the Minnesota Ceramic Co., at Coon Creek, Minn., has come under new management, S. J. Hewson, the Minneapolis sales agent of the Menomonie Hydraulic-Press Brick Co., having bought an interest in the business personally, and he will hereafter operate the plant. He has resumed operations there, and is preparing for a vigorous campaign for business.

St. Paul Notes.

The Keith Co., architects, have plans for a two-story and basement building for the Kimball & Storer Co., to be erected at Fourth Street and Fifth Avenue South. It will be of pressed and cut stone, reinforced concrete fireproof construction. The excavation will be done during

the winter, and work will progress in the spring. Cost \$50,000.00.

Joyce Memorial Methodist Episcopal Society has had plans prepared by Downs & Eads, architects, for a modern church to be erected at Thirty-first Street and Fremont Avenue South. It will be of mission style, reinforced concrete construction, costing \$35,000.00.

Martin T. Roche, representing the Alpena Portland Cement Co., sold 9,000 barrels of Portland cement for use in the extension of the Hackett-Walther-Gates wholesale hardware warehouse. The work is now well along. Alpena cement is to be used in the Lindeke, Warner & Sons, building at Fourth and Broadway, for which the concrete piling has just been installed.

THE WEST COAST.

SAN FRANCISCO, CAL., December 8.—The building record for November and the first half of December has shown a steady increase notwithstanding the "labor wall" around San Francisco, which has made it difficult to increase the working forces of mechanics in the building trades. About 1,000 building permits were issued by the Board of Public Works during the month of November of which 674 were for permanent structures. The estimated cost of these improvements is \$7,230,000.00. Fifteen buildings of reinforced concrete costing \$829,000.00; 173 of brick, costing \$3,917,000.00 and 343 of frame costing \$2,644,000.00 included in the list. December opened up even better, the applications for permits during the first week of the month aggregating in cost \$2,172,000.00. In Oakland, Cal., during November 428 applications were filed for building permits and the estimated cost aggregated \$930,000.00.

In Los Angeles, 653 permits were issued during the month of November representing a total valuation of \$1,089,543.00. This shows a slight decrease in both number and valuation of November permits in the Southern California metropolises as compared with the four years preceding.

Although an officer of the Building Trades Council has asserted that over 1,000 carpenters are idle in San Francisco it appears to a disinterested observer that there is still a shortage of labor in all lines. There are more advertisements in the papers than usual for mechanics in the building trades, especially for plumbers.

There is enough foreign cement on hand for some little time to come but the market is firm at perhaps a little better prices. About \$3.25 is quoted for good European cement, although better qualities are held at \$3.50 or more and some of the poorer grades can be had at \$2.75. Arrivals of foreign cement on this coast have kept up pretty well, but there is not a very great quantity going into ships now on berth at European ports. Too many new hands at the importing business got their fingers burned during the slump in prices a few months ago caused by bringing in tremendous quantities of cement from Europe before the rebuilding of the city had reached a point where there was a heavy consumption.

San Francisco's daily consumption of cement will, perhaps, average 7,000 or 8,000 barrels at present. Much deterioration of stocks arriving is likely when the heavy rains set in. The arrivals of foreign cement during November were 153,217 barrels, and about the same average continued through the early part of December. Domestic cement still cuts no particular figure in the local situation. The companies manufacturing in California have not increased their outputs materially this year and it will be well into next year before the two large new cement mills near Santa Cruz will have their product on the market. Scarcity of labor and material had much to do with the delay. The settling of the strike at the Standard Portland Cement Co.'s mill at Napa Junction has enabled this company to make a better showing but its output is largely sold ahead.

* Some of the engineers in charge of the Owens river water system projected for the purpose of supplying the city of Los Angeles with mountain water through a cement conduit 240 miles long favor the construction of a cement mill at a point near the line of the great duct. A large reservoir is to be built at Halwee and the estimated cost of the concrete impounding dam and other work at that point is estimated at \$60,000.00.

A company has been organized in Nevada with Senator Nixon, D. H. Linton and R. H. Richardson among the stockholders, for the purpose of installing a cement mill. It will use as raw ma-

terial the tenacious carbonate of lime deposits found in the mountains north of Ely. It is thought that the product of the proposed plant can be profitably disposed of as the high railroad freight rates to the mining districts make the cost extremely high at present.

The Pacific Concrete Machinery Co., agents for the American system of reinforcing, have taken orders for 40,000 square feet of re-inforcing fabric for the new 6 story Latham Building at Fourth and Mission Streets and 75,000 square feet for the Western Meat Co.'s great storage plant under construction at Sixth and Townsend Streets.

The Pacific Construction Co. have taken a \$12,000.00 contract for the erection of a concrete building for the French Catholic Church on Bush Street. A parish house is also included in the plans.

In Los Angeles and vicinity re-inforced concrete has entered quite largely into the better class of business structures erected and in plan this year, although by far the greater proportion of all building work there is frame. The fatal collapse of the Hotel Bixby at Long Beach, Cal., which was under construction by Los Angeles engineers, has given rise to all sorts of opinions more or less justified by the circumstances. A report by San Francisco engineers has been made public but the representatives of the Kahn system of reinforcement take exceptions thereto and hope to refute some of its findings. The representatives of the state bricklayers' organization, of course, gave re-inforced concrete the worst of it in their report on the matter.

The Kahn people say in explanation: "The building was originally designed and carefully detailed with twisted bars and the contract was let to E. S. Spalding, Los Angeles, Cal. When the owner of the building observed some buildings of our system of hollow tile construction he decided to use the same for his floors and so instructed his contractor. In accordance with this, Mr. Spalding purchased from us the necessary bars for the floor slabs and beams, retaining the original design with twisted bars for the footings, columns, lintels, and veranda floors. We have never had anything to do with the construction of the building nor has any of the men directly connected with this company ever been near the building."

The Northhampton Portland Cement Co. is the latest San Francisco concern organized for the purpose of exploiting California deposits of lime, rock and clay. The directors of the company, which has been incorporated with a capital stock of \$12,000,000.00, are A. F. Morrison, Edwin Schwab, R. M. Sims and R. M. Moore.

A fine Class A building with steel frame and reinforced concrete floor construction will be erected on a lot 50 by 80 feet at the southeast corner of Second and Natoma Streets by Barker, Knickerbocker and Boetwick. The design by J. C. Pelton, calls for a six story and basement structure as nearly fire-proof as possible and costing more than \$150,000.00. No wood finish will be used.

Mahoney Bros. will construct for Florence Blythe Moore a Class A six story building at the southeast corner of Market and Second Streets at an estimated cost of \$300,000.00. The materials are to be steel concrete and brick with very deep and heavy concrete foundations.

The Italian American Bank will have a four story Class A steel frame building erected at once by Mahoney Bros. at the corner of Sacramento and Montgomery Streets from plans by Howard & Galloway at a cost of \$120,000.00.

NEW ORLEANS.

NEW ORLEANS, LA., December 20.—A monument has been erected in the very heart of the city of New Orleans to re-inforced concrete. Some months ago, the Consumers' Electric Co., in improving its plant erected a smoke stack 298 feet high of re-inforced concrete. The stack was scarcely completed before the New Orleans Terminal Co., wanted several squares of property for its passenger terminals. The Consumers' Co., owned a part of the property and sold it to the Terminal Co. The contract for raising the buildings was let, smoke stack and all to Feitel. For tearing down the stack he was to receive \$5,000.00 and deposited \$1,000.00 to insure the faithful performance of the work. He placarded it with such words as these: "Watch me fall," "The only Feitel will take me down."

Feitel went to work but the chimney did not

fall and he went to the Terminal Co., and gave up the job. It is unnecessary to say that the smoke stack yet stands as a monument to the staying properties of re-inforced concrete. The engineer who superintended the erection of the stack estimated that it would take between \$4,000.00 and \$5,000.00 to remove the stack.

The Consumers' Electric Co., is building a new plant and so well pleased was the company with the construction of its former plant that re-inforced concrete is being more largely used in this than in the former. The company's office building is 32 by 45 feet six stories high. It is fire-proof construction. The side walls, floors and roof are re-inforced concrete with steel frame work.

The new smoke stack is 261½ feet high and 15 feet inside diameter. It is constructed of re-inforced concrete but the mortar is much richer than the ordinary mortar. It is made of concrete and sand without crushed rock or gravel or shells. The power house is a 5,000 horse power plant with concrete floors. The foundations are of piling overlaid with a concrete floor four feet thick. The engines are 16 feet above on solid concrete bases.

EVOLUTION OF CEMENT.

(Continued from Page 20.)

come and do his structural work. The cottager in the suburbs is finding how to help himself in the same way, and the demand for concrete blocks in all localities where the market conditions are favorable will continue to grow with prodigious strides. The use of cement in the manufacture of concrete building blocks has consequently become a factor of no mean proportion and one which is bound to grow.

The manufacture of sand and cement brick became popular in 1905, and with the introduction of a number of machines for economically moulding concrete brick, this feature of the industry has made great progress. Like the concrete block the manufacture of brick from sand and cement depends entirely upon the market quotation of the materials from which the brick is made, with reference to the local costs of other kinds of brick. Naturally in a locality where the cost of manufacturing cement brick is higher than the selling price of good clay brick, there would be little or no market for the cement brick; but there are many localities where no brick can be had except at a high price, and where sand is cheap, cement brick can be made profitable much lower than any other building material of the same good quality.

Cement Shingle or Roofing Tile.

During the present year great progress has been made in the perfection of the cement shingle or roofing tile. There is still a number of drawbacks and difficulties to be overcome, and yet the perfect cement shingle or tile is assured. The re-inforced concrete roof, consisting of sectional spans, is a pronounced success, as well as the roof constructed of plates of concrete made with expanded metal embedded in the mass. Such roofing plates, from an inch to an inch and a quarter thick and two feet wide by three feet long, when laid upon channel iron rafters, make a perfect fire proof roofing material of the very highest type, although perhaps more expensive than ordinary sheet iron roofing material. Yet the concrete roof has the virtue of requiring no paint and does not disintegrate from the ravages of time or from atmospheric causes. With the perfection of the shingle, the reinforced span and the roofing plates just described, it is easy to see that more concrete roofs will be continued to be used as builders become better acquainted with the use of this wonderful material, which seems to have practically no limit to its adaptation for structural purposes.

We have thus shown that from the bed-rock foundation to roof itself, including every structural member, all the floor spans and walls, with interior partitions, plain or ornamental stairways, chimneys, mantels and massive decorative features, it is possible to build any conceivable plan of a structure with the different applications of one material only that we have come to call concrete, which is a mixture of Portland cement, sand, gravel and crushed rock. This mixture is pliable as wax and readily adapted to the command of the designer, economical beyond anything that man has ever known, fire proof, vermin proof, safe and everlasting, the greatest boon of the Twentieth century.

Quarries.

The National Quarry Owners' Association

Meets Semi-Annually.

D. McL. McKay, Chicago, Ill. President.
Chas. A. Pfeiffer, St. Joseph, Mo. First Vice President.
E. T. Fancher, Albion, N. Y. Second Vice President.
Sol. M. Wolf, Bellevue, Ohio Third Vice President.
B. H. Debebaugh, Louisville, Ky. Secretary-Treasurer.

Official Organ, ROCK PRODUCTS.

Screenings From the Crusher.

The extent of the crusher operations of the year just drawing to a close has only been bounded by transportation facilities and it is safe to say that not a single crushing establishment in the country has failed to make a good round profit for the operator, and this could easily have been doubled if the transportation man could have been ready with the car whenever it was needed. A large number of new plants went into commission this year and every one of them have made good in big numbers. Still a larger percentage of the old established crushing concerns largely increased the size of their output by the installation of additional machinery. There are twice as many two-unit plants in operation to-day as there were two years ago.

The people who are engaged in the manufacture of machinery for the use of the crusher operator have simply been swamped with orders. Especially is this true with the larger concerns who conduct an engineering branch in connection with their business and make a practice of contracting for the erection of complete plants. There have not been any radical improvements in the general character of the machinery for crushing purposes, which is the best evidence that those machines already well known and proved out in practice are somewhere near perfection, or at least as good as can be expected within the range of profitable investment.

There never was so much attention given to the matter of distinct separation of the smaller sizes that come from the crusher. The progress of the industry may then be said to be the development of the use of small sized screenings and the saving of the crusher dust as a valuable by-product in place of considering it, as in times past, a strictly waste feature that was bound to create an expense for removing out of the way of the profit-bearing operations. Now that crusher dust has come so much into demand for the manufacture of concrete blocks and bricks, as well as in many other specifications of concrete work, this dead waste, as it was considered only a few months ago, is turned into a profit unit and the clean, fine screenings of several distinct and well separated sizes are bringing greater prices than macadam stone or ballast rock. It is another case of the stone that was rejected becoming the chief item of usefulness. The crusher man who is located near enough to markets, where concrete operations are carried on upon a large scale, should not overlook the small expense necessary for a complete screening outfit to take care of this feature which in the course of a season will bring more money than any part of the operation, if intelligently handled. Even where it is not possible to reach such a market there are many places where the crusher man at small expense can establish a subsidiary operation to his crusher establishment for the manufacture of concrete building blocks and bricks which find a ready sale in almost any neighborhood.

It is not so much a case of running your machinery full tilt until it is worn out upon the big contract for ballast with the railroad company as it is to stop all the leaks by using everything that is produced by your plant as an incident to the production of the material specified in your main contract. The saving of these by-products in many plants has meant in this past year the

doubling of the income from the same amount of steam, the same amount of repairs and the same amount of cost of the quarry operations, and that means practically a doubling of the profits of the crusher operations.

The production of crushing rock this year, although enormously larger than the one immediately preceding, was quite inadequate. It is safe to say that if double the amount of crushed stone could have been delivered it would have found a ready market at good profitable prices.

Crushed Stone in Nebraska.

A correspondent writing from Ashland, Neb., says: "The stone quarries along the Platte river east of Ashland, are one by one, being opened and equipped for crushing stone. The Cedar Creek Stone Works has been in operation for a number of years, and has been behind its orders for fine crushed rock all summer. A quarry and crusher plant has recently been opened at Louisville and a company is being formed at Plattsmouth and South Bend for the same purpose. There is almost an unlimited demand for crushed rock in this locality since the introduction of the artificial stone industry which has continued to grow to enormous proportions. Parties best acquainted in this section state that there are a number of old abandoned quarries along the Platte river from this point to its mouth which are first class locations for profitable stone crushing operations.

Crushed Rock Short of Demand.

The contractors for many municipalities located in every part of the country, who have street improvements in hand, complain in one great chorus that they are unable to secure any crushed rock with which to complete the jobs that were stipulated to be brought to a close before winter comes on. At Petersburg, Va., Spartansburg, S. C., St. Louis, Cincinnati, Chicago, Milwaukee, Omaha, Denver, Sacramento, San Francisco, Los Angeles, and other places too numerous to mention, there is but one chorus, the crushed rock is most deplorably short of the demand.

Nayaug Stone Company Organized.

SCRANTON, PA., December 8.—A new stone company has been organized here recently to be known as the Nayaug Stone Co. The stock is held by W. A. Fitzsimmons and W. F. Boyle, of Scranton, and Harry Denzell, of Courtland, N. Y. The quarry which they will develop is located on the Dunmore branch of the Laurel line and the stone is claimed to be the finest ever located in the state of Pennsylvania. It will be operated as a building stone quarry, a crusher plant will be erected and the company expects to furnish a fine variety of building block and crushed stone for road work and for use in general concrete operations.

Railroads Buying Quarries.

RACINE, WIS., December 10.—On account of the shortage of the supply of ballast and the consequent high price the railroads carrying on construction operations are buying quarries and erecting plants to crush their own stone. It is reported that the Chicago & Milwaukee Electric Railway Co. has bought a forty acre tract of limestone land north of this city and that a contract has been let for the erection of a \$40,000.00 crushing plant. It is reported that the Northwestern Road is on a trade for a large tract of stone on its Chicago & Milwaukee division where they intend to erect a crusher.

Iowa Falls Operations Brisk.

IOWA FALLS, IA., December 4.—There are large quantities of limestone and sandstone along the Iowa river awaiting development, but still the stone business can be said to be pretty brisk in this locality, for four plants are operating extensive crushing propositions, the interests represented being the Barber Stone Crusher Co., the Ellisworth Stone Crusher Co., J. H. Basquerville Stone Quarries and the V. A. Biggs Stone Quarries.

Rebuilding Crusher Plant.

NEWCASTLE, PA., December 6.—The work of rebuilding the crusher plant of the Croton Limestone Co., which was destroyed by fire in September, has begun. The contract for the improvements amounts to \$20,000.00.

Limestone Deposit in Mississippi.

JACKSON, MISS., December 15.—It is said that an extensive vein of good, hard blue limestone has been located near this city. The Illinois Central railroad has sent an expert engineer to investigate the quality of this rock with a view to establishing a crushing plant. Local capitalists are also investigating the advisability of establishing a crushing plant to cater to the local macadam trade and the requirements of the concrete industry of the section, which is becoming very important.

Running Up to Capacity.

The A. J. Yawger Co., Indianapolis, Ind., operators of the well known quarry and crushing establishment located at Ludlow Falls, Ohio, operating principally in railroad ballast, say, "This season's business has been exceedingly good and we have been running our crushers up to capacity when cars could be had. At the present time we are short on cars for loading for several points, and this is the only drawback to our operations."

Labor Scarce in Ohio.

In an interview W. I. Taylor, of the Columbus Macadam Co., of Columbus, Ohio, said: "The feature of the crushed rock proposition in central Ohio this year has been the unprecedented demand and the difficulty to secure labor. Every operator in this district has had all the business he could possibly attend to, but the drawback of inadequate labor has been a great burden upon the business. Even with the high prices now in vogue for common help there seems no inclination on the part of the men to put in an honest day's work. It looks like the higher the prices paid the less they are willing to do. A very small percentage indeed of the laborers now employed by our company are native born Americans and the foreign element, which accepts the situation, is next to nothing in value." in the near future.

Crushed Rock for Roads.

LITTLE FALLS, N. Y., December 10.—The Little Falls Stone Co., that recently completed what is considered to be one of the largest stone crushing plants in the world, has at last gotten it in full operation and has already exceeded the guarantee capacity of the contractors which was that it should be such a plant as would turn out 5,000 tons daily. This large and modern stone crushing plant was built within five months actual building time, entirely without accident or mishap, and that during the same time a half mile of quarry breast has been developed and tracked ready for business caused the president of the company, Henry A. Shafer, to receive the hearty congratulations of his associates as well as high compliments from experienced engineers of the N. Y. C. & H. R. R.

The most gratifying feature is the enormous demand for the product of the plant. Almost every day the company is refusing orders for crushed stone and enough business is now in sight to take care of full capacity for two years to come. New York Central officials indicated that they would be glad to contract for three times the total output of the ballast that can be produced upon present capacity. This is only one feature of the business, for in the production of ballast a much larger profit will be realized from the sales of the smaller sized stone which are used for macadam and general concrete purposes.

Nearly 2,000,000 yards annually of macadam stone will be required for the construction of good roads during the next 10 years within the neighborhood of Little Falls and it is said that the rock in which this crusher plant is now operating is the only suitable stone for road building on the entire route of the Erie Canal west of the Palisades. The present demand for crushed rock from this great plant extends from Albany to Rochester and whenever boats are available for shipping by way of Erie Canal the stone can be sent much farther.

The Clinton Point Stone Co. has purchased a large tract of quarry property adjoining their present holdings, near Newburgh, N. Y., in order to increase the capacity of their crushing operations



CRUSHING PLANT OF THE D. C. STATLER CO., PIQUA, O.

FINE QUARRY IN WESTERN OHIO.

Backed by a Successful Record of Sixty Years Operations—Future Progress is Assured.

The famous Piqua quarries, located about one mile South of that city, in Miami county, Ohio, one of the richest in the famous valley of the Great Miami river, have for many years produced a fine quality of limestone that has been used for bridge and foundation purposes, as building stone, rubble and even dressed architectural stone. For years they have operated an extensive crushing plant, turning out railroad ballast and macadam stone under the firm name of D. C. Statler & Co. In recent years the firm has been changed and is now known as the D. C. Statler Co., with D. C. Statler, president; W. M. Bane, vice-president and L. W. Statler, treasurer and general manager.

Naturally the present general manager of this company knows the stone business in every phase, and is one of the most practical men in his line in the country. He does not depend upon any one connected with the institution for his information with regard to any of the details of its operation. He puts on his leggings and buckles right into the work with a will, and one is just as apt to find him at the top of the crusher plant oiling a gearing as to see him at his desk in the city office. His energetic methods and good sound judgment is bringing his concern to the place in the stone crushing industry that the quality of the product and the promptness of the service rendered entitles them to.

The piers of many of the railroad bridges in Miami county and the region next adjoining have been built from stone taken from this quarry, and there is a long list of handsome buildings that have been built of broken ashlar from the Piqua quarries. Among these may be mentioned the elegant Plaza Hotel at Piqua; the beautiful M. E. church at Miamisburg and the High Street church at Springfield. One of the finest roads in the United States is the pike leading from the city of Piqua to Troy, the county seat, and the stone from which this macadam was made came from this very quarry. The high binding qualities of the macadam stone furnished by the D. C. Statler Co. are well known within their shipping territory.

The crushing plant, which is located alongside the tracks of the D. R. & G. railroad, has several unique features in active operation, which are giving good results. From the plant proper to the loading track there has been erected a belt conveyor constructed of ten inch "Leviathan" belting to load the stone dust directly to the car for shipping.

The screen used at the plant was designed by Mr. Statler himself and constructed with the assistance of the plant blacksmith, and the separat-

ing screens are so arranged that they can deliver the product of the crusher from 3-16 of an inch up to 2½ inch sizes directly into a wagon without any handling whatever. The plant at present has a capacity of 50 cars a day and they expect to enlarge this output to a considerable extent in the early spring. At the present time Mr. Statler is installing an automatic air separating system, which will extract the dust from the stone at the time it is screened. A roll crusher ten feet in length and 30 inches in diameter of the Allis-Chalmers type, is used to do the crushing and a Munsen pulverizer is used in this department.

Piqua is a first class shipping point, one of the best in the state of Ohio, for the C. H. & D. railroad system gives an outlet North and South, while the Chicago and Columbus branch of the Pennsylvania Lines gives an outlet to the East and the West. Besides this there are many good turnpikes with an easy haul from the quarries to a very considerable distance at small cost. The steady growth of this high class stone plant in Western Ohio is to be expected, for the concrete operations of the neighborhood are growing in importance at an enormous rate, and no stone of a similar quality is to be had so well adapted to the requirements of the concrete industry.

Still Fighting Hook Mountain Bill.

NEW YORK, December 15.—The Interstate Palisades Park Commission are preparing to bring eviction proceedings against the quarrymen who are blasting away the face of Hook Mountain, while the quarrymen are preparing to oppose it as unconstitutional. But the Park Commission's lawyers say that question was fully disposed of when the original fight was made last spring in the legislature. The quarrymen hold out for \$4,000,000.00, while the Park Commission say their entire holdings are assessed at a little more than \$200,000.00. The friends of the project are worried over the prospect of delay as the condemnation act calls upon them to acquire the land within eighteen months after the passing of the act. The limit will expire October 3, 1907.

They fear they will have to go to the legislature for additional time. This is not agreeable to them as the original measure was only passed after a hard struggle. A number of quarrymen say that the Hook Mountain rock is absolutely necessary to supply the stone for the newly projected State roads.

On the other hand Engineer Leavitt says: "This assumption is totally unwarranted. Not only has the State engineer assured me that he can get the necessary rock near by, outside of the limits of the proposed reservation, but I have his assurance that he is greatly interested in the success of the park plan, because it will supply an essential link in the chain of State roads he has planned."

The Banner Rock Products Co., of Alexandria, Ind., has been incorporated with a capital of \$30,000.00 to quarry, cut and crush stone. J. Evans Lippincott, Nathan Booth and Albert A. Gallman are directors.

INDIANA CRUSHING CONCERN.

A. & C. Stone and Lime Company Operating Plants at Portland, Ridgeville and Greencastle.

Indianapolis, the capital and metropolis of the great State of Indiana, is a modern progressive city of the first class, both with regard to the concentrated accumulation of wealth by reason of her profitable commerce with the rich outlying districts which surround her on every side, as well as the character and extent of her many fine public and commercial buildings and extensive municipal improvements. Frequent mention has been made in these columns of A. B. Meyer & Co., the progressive firm of supply dealers, who enjoy a leading position in the trade of their home city as well as the smaller cities and towns of Central Indiana. A. B. Meyer is the presiding genius of this concern and there is not a barrel of cement or lime or in fact any other classification of mason's supplies sold in his territory without his concern being in touch with the transaction.

The rapid growth of the concrete industry and the importance that it has assumed in all structural undertakings could not fail to be interesting to such a concern and recently Mr. Meyer became connected with a new interest which places him in touch with and again in the lead in a thriving industry which is becoming more important all the time by reason of the agitation of good roads, street improvements and concrete construction, and this new interest is none other than that of crushing stone, the indispensable factor of concrete operations of every description.

More than fifteen years ago J. C. Armfield, of Portland, Ind., started into the crushing business like so many of the older crusher men for the sole purpose of producing railroad ballast. Shortly afterward the firm became known as Armfield & Cartwright and three ballast plants were put in commission at Portland, Ridgeville and Greencastle. In the present year, owing to the remarkable growth of the demand for crushed limestone, as well as the change in the specifications called for by the new interests entering into the trade, a new organization was formed using the initials of the old firm and with \$250,000.00 capital stock, the A. & C. Stone & Lime Co. was incorporated with general offices at 17 N. Pennsylvania Street, Indianapolis. The officers of the company at present are J. C. Armfield, president; W. H. Detamore, vice-president and A. B. Meyer, secretary and treasurer. Every man in the firm has already proved himself a success in the business world. The company operates three extensive quarries, those formerly operated by Armfield & Cartwright. They are extensive manufacturers of high calcium lime at Portland, Ind., which is fired in kilns, using natural gas and beside this their three crusher plants produce fully 4,000 cubic yards a day.

At the present time the company is engaged in construction work at their Greencastle plant.



A. B. MEYER, OF A. & C. STONE AND LIME CO.

where the improvements now under way will practically double the capacity of that establishment. This plant will be devoted solely to the crushed stone business, furnishing the various sizes called for by the concrete contractor and for street macadam. The Ridgeville plant has been in operation for three years, having a capacity of 1,800 cubic yards a day. All of these plants are equipped with modern crushing machinery and the latest appliances for the handling of crushed stone, all of them being provided with storage bins from which the cars can be loaded by gravity chutes, providing for the loading of a whole train of cars inside of thirty minutes.

With separating screens five different sizes of crushed stone are sent into as many different bins including the fine screenings and crusher dust which are so sought after by the concrete contractor in street paving and block and brick manufacturers. Each of the three plants is under the charge of an experienced superintendent who looks after the minutest details so as to give expert and immediate service. All of these plants will be kept running throughout the winter as contracts are already on file for 125,000 cubic yards of crushed rock of various sizes. Thus holding the plants open all the year round the company will be in a position to take care of such orders as come to hand at any season, for the accumulation of stock at a plant running full time at such a capacity is enormous.

The quality of the limestone in Central Indiana is well-known to be firm and hard and ranks high as a macadam stone, and analyses show that it is well adapted for fluxing.

J. C. Armfield, the originator of this primary crushing institution of Central Indiana, still gives the business his personal supervision.

Blasting Talks.

"Blasting Talks" is the title of a book that is being sent out to the quarrymen by the Aetna Powder Co., of Chicago. Mr. Allen, of that company, explaining why this was being sent out, said: "Realizing the danger of having on hand and using in every day business explosives of the character necessary to do the heavy blasting in the quarry business, we find that foremen and employees, as well as the employer himself, disregard instructions in reference to handling this powder, and we hope this series of special information will impress on our customers that fact that good materials naturally must have strength and blowing power or they would not do the work for which they are sold, and if we can, by acts of precaution, impress this fact on our customers' and their employees who handle the material, we will protect them against losses and at the same time furnish them material that will move the world."

Railroads to Crush Stone.

CHICAGO, ILL., December 20.—The Chicago and Milwaukee Electric Railway Co., has purchased the Horlick property a few miles north of Racine, Wis., which contains limestone suitable for crushed stone. They will erect a large and complete plant and expect to furnish all the stone for ballast and grading purposes for their road from this plant. They are in the market for machinery and equipment for the plant. The erection and purchasing of the plant are under the supervision of the company's engineer, Mr. Garret.

The Chicago and Northwestern Railway Co. through its purchasing department has issued a set of specifications for a complete stone crushing plant. The specifications call for one number 7½ crusher and one number 5 crusher; 60 feet 7½ elevator one 16 feet by 48 feet screen; one 10 feet by 48 feet screen. All the power transmission machinery excepting the engine and boilers. They intend to erect three plants of the above specifications and crush stone to be used for grading and other purposes along their line. One of the plants is to be at Oakfield, Wis., one at Mankato, Minn., and the third near Carroll, Iowa.

Will Sell Flint Crusher.

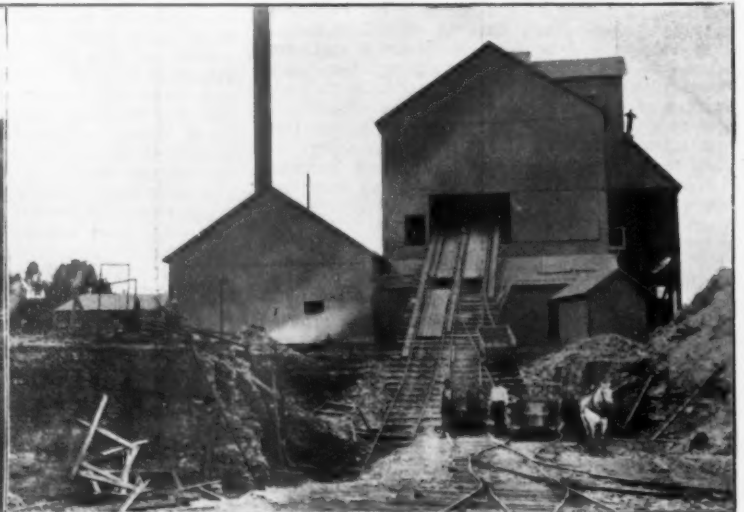
CAPE GIRARDEAU, Mo., December 12.—Edward Hely, crushed stone contractor, has closed down his plant at Monon, Ind., where he had a fair season's work. He has been unable to push his flint crusher at West Point, Ind., and will offer it for sale. He will continue operating his plant here throughout the winter.

Will Open Crushing Plant.

LOUISVILLE, KY., December 17.—The Indianapolis and Louisville Traction Co. has purchased an old limestone quarry situated about nine miles north of Jeffersonville, Ind., near Speeds, where they will install a crusher to make ballast for the construction of their road. A part of the equipment will consist of two heavy locomotives for the purpose of moving trains of ballast.



THE CRUSHED STONE AND LIME MANUFACTURING PLANT AT PORTLAND, IND.



THE STONE CRUSHING PLANT AT RIDGEVILLE, IND.

Lime.

The National Lime Manufacturers' Association.

Meets Semi-Annually

Peter Martin, Huntington, Ind. President
 O. F. Perry, New York City First Vice President
 W. B. Hill, Kansas City, Mo. Second Vice President
 A. A. Stevens, Tyrone, Pa. Third Vice President
 C. W. S. Cobb, St. Louis, Mo. Treasurer
 R. H. Delebaugh, Louisville, Ky. Secretary

EXECUTIVE COMMITTEE:

Chas. Warner, Wilmington, Del.; O. W. Robertson, Milwaukee, Wis., and the President.

Official Organ, ROCK PRODUCTS.

National Lime Manufacturers' Association.

The annual meeting of the association will be called to order by President Martin, of Huntington, Ind., at the Southern Hotel, Columbus, Ohio, February 4, at 10 a. m. You are expected to be present and we ask your co-operation and we believe the program which has been outlined by the executive committee and the other officers, will pay you for the trip to Columbus. We selected this date, owing to the fact that there are many lime men interested in the Builders' Supply Convention, which is held at the same hotel in the same city the three days succeeding. Columbus is a good central point, which makes it possible for Easterners to get there with only one night, and the same is true of the far Westerner interested in lime. Let us get together and see what we can work out for the benefit of the lime business.

The subjects for discussion at the National Lime Meeting are:

Economical effort in securing a regular daily supply and keeping the face of the quarry in good condition.

Recent mechanical inventions applied for the limestone quarry.

New discoveries and specialties in blasting.

The steam shovel as a factor in limestone stripping and loading.

The central power plant in the application of electricity in securing greater economy.

How to burn lime economically, and suggestions as to the fuel and the construction of the kiln.

The art of drawing lime to secure the best quality.

The best method of loading lime on cars; the most adaptable package and the quickest cooling device.

How to secure the best price by marketing lime to responsible dealers.

New uses for lime; how to create and develop them.

Expert accounting in the lime business.

In addition to this "Uncle" Peter Martin will give one of his shoulder talks on "How to together sticken."

Co-operation in Lime Business.

Lime making has been carried on since in the early days when the pilgrim looked about to get some lime to make mortar instead of having it shipped from England, and it was then that the small lime kiln on the Atlantic coast became a factor in the building supply business. It was the primitive element that continued to furnish the lime, for these many years, until a few years ago it was decided in several sections of the country that permanent continuance in the business would be assured if more intelligent co-operation could be had between manufacturers; but for a century there had not been an organization

that made it possible for the lime manufacturer in Alabama and the Yankee in New England to tell each other how they did it.

Business went on of course and lime was sold perhaps cheaper, considering the material and effort necessary to manufacture it, than any other product of the rock. First, because the manufacturer went on year after year without inaugurating any new ideas in the burning of lime or in selling it, and the trade was demoralized everywhere. It is true that a few manufacturers in the Southland had gathered together several times, a few of them in the Southwest had thoroughly associated, but it was practically confined to a few states. In the central states a Moses at the head of it was doing good, but throughout the whole business notwithstanding these efforts to improve the condition, there was distrust, very few new appliances had been invented and inaugurated in the various plants, and there was little prospect of much improved conditions. If the enterprising manufacturer, and there were a few of them, got an idea that he could burn his lime more cheaply by the application of some new system, he had to dig down in his pockets and spend his money like a drunken sailor hoping that he would succeed and improve his condition.

There were even men in the trade who had put a brand on the market in hydrated lime, but everything was at sixes and sevens in the industry. Nobody cared a d— what his neighbor was doing. He only would yell when you happened to mention his competitor's name, that he was a price cutter, that his barrel of lime was short measure, and his lime was no good anyhow and he only sold it because two or three generations of his name had been making lime and selling it for just about what he could afford to pay for his material and make the lime up. In other words lime was selling at cost and was practically being sold the same way as fifty years before.

If the manufacturer from Missouri happened to be trying to sell lime in the same territory with the man from Alabama, they couldn't get together. There was too much distrust. There was the feeling on the part of one that the other was trying to interfere with his business and on the part of the other that if you made an agreement with him, he wouldn't stick, and so it was a common occurrence to hear a lime man say: "O darn this business, there is nothing in it. We are being hemmed in by competition in other lines, the hard wall plaster man is chasing us to the woods, and yet we sit here like a lot of bumps on a log and allow ourselves to be exterminated."

It was at this point in the business life of the trade, four years ago when it occurred to a number of manufacturers who had been approached by Rock Products that a national lime association would tend to improve the business, and it has. There has been more progress made in the lime trade in four years than in the forty years previous. In that time hydrated lime has become a fixture in the business. In other words, you can take magnesite lime, hydrate it, put it in sacks, ship it to a dealer, keep it in his warehouse without losing all of its value. It has been the keynote for a new demand, and if followed up properly by all the manufacturers it would insure a greater consumption of lime in addition to the old style way of selling it, and you can get much more for your product.

One of the troubles of the past has been to keep the fuel bill down to an economical basis, and beginning a year preceding and the four years just past experiments have been made and a fact established that lime can be burnt more economically and cleaner lime made with less difficulty with a gas producer than in the old days when wood burnt lime had a reputation from Hong Kong to Jerusalem via the United States and backwards. The exchange of the ideas at the meetings held in the past four years has established new lines of trade. In the old states where land needs fertilizing and increased demand has followed because of discussions and the gathering of information by experts on this subject for the benefit of lime manufacturers. It has been demonstrated by scientific experts that in the purification of water alone that millions of bushels will be used in the near future. It has been gratifyingly demonstrated by the exchange of ideas that it pays the man from Alabama or Maine, or Pennsylvania, or Missouri, to spend two days at the national association meeting. And yet this organization, having money in the bank, is suffering from dry rot, and this dry rot is caused by selfishness, that has remained in the ranks of this business notwithstanding the fact that we are

in a broad-gauged age, and it's only the people who get the money who are big enough to see over their back fence.

Of course, it's true, we have been fortunate in the selection of the presidents for the past four years, and having in our membership broad, liberal-minded, high class manufacturers who were not satisfied to sit down and operate as their grandfathers did, but improved their plants, introduced new brands for which they secured a good price, and came to our meetings with an open book willing to give up their information that cost them money, and did so. Others would not even contribute their ten dollars for dues and had nothing to offer for the benefit or the good of the cause, but kept both ears open as well as their mouth and if they were to tell the truth they would tell you in a few words that they had the money in the bank because of this information that is brought out in the discussions at these meetings. We know that the influence that has had its birth in this organization is responsible for a number of local organizations that have made pleasure and profit out of an industry that was dragging its hind legs on the ground; and yet there are factors in the lime business who, when asked if they would be a party to one hundred men to spend fifty dollars a year to improve the business and to strengthen the arms of this association, have said, "No, let's see what your Moses will do first." Notwithstanding that every individual operating in the lime business would have more money in his pocket, would operate on more modern lines, and would be known as of the class of prosperous business men who belong to a fold that had a man whose job it was to give them his time, his energy and his best thought.

This was the condition of affairs that prevailed in the National Lime Association a few months ago. Some of the largest factors since have become discouraged because of this laxity of purpose and narrowness of thought that made it impossible for the executive of this association to carry out a more aggressive campaign for the benefit of the whole trade. The question before you to-day, gentlemen, is: Are you going to sit still and let this organization, that has done so much for you, whether you admit it or not, die of dry rot, and give more progressive men the opportunity to get together by themselves, exchanging ideas and making experiments that will make them money while you willingly, knowingly are left out in the cold and must fight your own battles?

Rock Products says no. We believe there is a place for a permanent, scientific organization, to be composed of as many in the trade who will spend from one to five hundred dollars a year for the promotion of better manufacturing conditions and meeting new innovations with the enthusiasm. To scientifically figure out how it will be possible to take care of the waste gases, to manipulate the by-products of the kiln in such a way as to make profit out of them, as they do in older countries where they have been confronted with what is facing the manufacturer of lime in this country to-day, how to get the most out of the product of his quarry and lime kiln—this will be the purpose. There is opportunity for the organization of a few more local bodies that will put the price of lime where it belongs and keep it there. There is a chance for a good live committee in the national lime association to spend enough time each year and money to combat competition by fighting fire with fire; in other words, making a special brand of plastering material that will compete with hard wall plastering, or in other fields of usefulness inaugurate and promote campaigns that will increase the volume of business and assist the material prosperity of the operative. But these various local bodies, these special organizations should be spokes in the great wheel in which the National Lime Association should be the hub and the rim. The men who have done the laborious work for this organization in the past are the busiest men in the trade. They are still willing to do their part, but are willing to do all the praying, pay most of the money, contribute most of the ideas and then be criticized for what they have not done. The time is ripe for manufacturers of lime everywhere to wake up. If you are not in active touch with the officers of this association, write them a letter as to whether you would be willing to do your part. If the trade at large will do this, there will be no difficulty to maintain an organization in this trade that will treble the previous results and give you greater satisfaction than ever that you are still a lime manufacturer.

Steady Growth.

The value of the total production of lime in the United States has been growing comparatively slowly, but the growth has been steady and is showing no signs of a decrease despite the fact that other materials have been placed in competition with it. Where lime has been crowded out in one place it has found another opening that more than compensates for the loss, so that the value of the production for the year 1905 was more than \$4,000,000.00 greater than the value of the production for the year 1896. The figures for the production from 1896 to 1905, inclusive, are as follows:

1896	\$6,327,900.00
1897	6,390,487.00
1898	6,886,549.00
1899	6,983,067.00
1900	6,797,496.00
1901	8,204,054.00
1902	9,335,618.00
1903	9,255,882.00
1904	9,951,456.00
1905	10,941,680.00

The production in tons for 1905 was 2,984,100 against 2,707,809 in 1904. The average price per ton had decreased only one cent according to figures furnished by the United States geological survey, that average in 1905 being \$3.67. These figures show that Pennsylvania leads as a lime-producing State with a production of 620,018 tons in 1905, valued at \$1,672,267.00; Ohio was second with a production of 327,373 tons, valued at \$1,056,721.00, and Maine was fourth with a production of 220,927 tons, valued at \$971,305.00. The average price for a ton ranged from \$2.45 in West Virginia to \$11.83 in Wyoming. It is safe to say that the production in 1906 was greater than in 1905, and with the increasing use of hydrated lime there is every reason to look for a prosperous year in 1907.

The National Lime Association.

The object of this association is to promote better methods and improve the business.

Membership.

Any reputable manufacturer of lime can belong. The meetings are held once a year; the membership fee is \$5.00 a year, the annual dues \$25.00. The organization has no salaried officers; the work is all done as a matter of love. An application for membership to the president or secretary will be given prompt attention.

Thoughts.

What is the increased cost of stripping?
Why is your drilling costing you more?
Do you handle with care your blasting material.
Can you haul your rough stone to the tippie by gravity?
Does your crusher give you the greatest efficiency?
Are your railroad contracts paying you as well since specifications call for inch and a half ring?
Is the iron industry paying you what it should for fluxing?
Are you getting some money out of the road contractors in your neighborhood?
Have you taken ten per cent off for wear and tear this year after including your repairs and expense account?
Does your lime kiln pay?
Isn't your fuel bill increasing in price?
Aren't you paying more for labor?
Will you not have to advance the price of your contract for next year's delivery?
Don't you feel the need of better mechanical equipment?
If not, why not?

Facts.

The production of lime has been increased.
More crushed stone has been used in 1906 than in any other year in our history.
More coal has been used.
More improvements have been made in the methods of manufacturing lime.
Hydrated lime is growing in favor.

The Standard Lime Co., of New York, has been incorporated for the manufacture of lime, plaster, cement, tile, etc. The capitalization is \$10,000.00 and the incorporators are: D. Solomon, A. Solomon and E. Furst, of Brooklyn.

Hydrated Lime as a Fertilizer.

Despite the fact that there has never been until recently a process in the use of lime for agricultural purposes in which a large per cent of its value as a fertilizer was not lost, lime has been so used for more than twenty centuries and today eminent authorities contend that it is the most economical and effective substance for bringing about desirable conditions in the soil. Lime has always been and is to day the best soil-tonic. The great trouble has been the loss in its application.

By the usual method of application the farmer buys his lump lime, slakes it by means of water and as soon as it is in its powdery state spreads it over the soil and harrows it in. The greatest difficulty with this method is the fact that the lime through exposure is permitted to "air" slake and by so doing absorbs carbonic acid from the air and is changed back to the carbonate, the form in which it existed before burning. To prevent this air slaking process the farmer usually covers his pile of lump lime with earth. But even this precaution does not altogether prevent a loss to the farmer of part of his fertilizer by reason of its return to the carbonate. In deed some authorities say that under this method more than one-half of the value of lime as a fertilizer is lost. This has been the chief argument against the use of lime for agricultural purposes. If this objection can be overcome lime manufacturers will be in a position to put manufacturers of phosphate fertilizers out of the business. It seems that they can do it by pushing the use of hydrated lime as a fertilizer.

In the first place it costs about the same to manufacture a ton of hydrated lime as it does to manufacture a ton of phosphate, but phosphate is only about twenty per cent fertilizer. For \$100.00 the farmer can buy as much fertilizer in hydrated lime as he can for \$100.00 in phosphate. In the second place hydrated lime removes the necessity of the farmer slaking his lump lime. Hydrated lime can be furnished him in the powdery state all ready for distribution over the land. It can be easily applied with a grain drill or lime spreader. Thus the expense of slaking is avoided. In the third place hydrated lime is not as susceptible to the carbonic acid in the atmosphere as it is to the lump lime, one-half the value of which, as we have already said, is lost by return to the carbonate. In fact some authorities say that hydrated lime resists the action of the atmosphere for years. So that when hydrated lime is applied to the soil the farmer can get practically its full value as a fertilizer.

It might be profitable for manufacturers of lime to experiment along these lines further. The statement was recently made by James J. Hill that the soil of America is "wearing out" and that in order to meet the increasing demands for his products the farmer must increase the productivity of the soil. If this is true, if the soil of our country must be "built up," just as is necessary when a man's system is "run down," it is up to the manufacturers to provide the soil-tonic and to find the best and most economical. While lime is regarded as the best fertilizer and hydrated lime seems to remove in a great measure objections to its use, there is always room for improvement. The manufacturer who provides the lime in a form for fertilizing that gives the greatest results for the least expenditure of money and effort has added to the economy of nature and for him awaits the fortune. Let the motto be, "Always room for improvement."

The Kenwood Heights Co., of Chicago, has increased its capital stock from \$200,000.00 to \$300,000.00, and has changed its name to the Devoe Lime Co.

The American Lime and Stone Co., of Parkersburg, W. Va., has closed a deal for 100 acres of land near Martinsburg, on which there are said to be valuable limestone properties. Directors of the company are: C. D. Elliott, Lyle Jones, C. A. Swearingen, H. B. McKinodey, C. D. Bumgardner, B. S. Pope, Edward Nelly and J. S. McCluer and B. E. Hiatt.

The Dover Lime and Stone Co., of Poughkeepsie, N. Y., has been incorporated with a capital stock of \$50,000.00. The plant will be at Dover Plains, and E. M. Hagerty and Patrick Flarty, of that town, are two of the incorporators.

The R. N. McCauldsh-Kinney Co., of New York, has been incorporated with a capital stock of \$2,000.00 for the manufacture of cement, lime, etc. R. N. McCauldsh, L. E. McCauldsh and W. G. Kinney, of New York, are the incorporators.

Ohio and Western Lime Company.

The Ohio and Western Lime Co., with headquarters at Huntington, Ind., and Toledo, Ohio, with plants at Huntington, Ind., Fostoria, Gibsonburg, Sugar Ridge, Tiffin, Genoa, Limestone, Lime City and Portage, Ohio, have a daily capacity of something like 8,000 barrels. They are building eight new kilns at Fostoria and three new kilns at Genoa, and are adding an additional hydrating plant at Huntington and "Uncle" Peter says, in pointing out the immense machinery that is being put in, that when completed it will be the largest and finest in the world, and he believes that the product secured will be superior to anything manufactured up to the present time. In March next, when the plant is in operation, it will have a capacity of 100 tons a day. This will give the company 300 tons of hydrated lime for the daily market for 1907. Other changes will be made in order to further modernize in every particular the splendid plants of this company and increase their operations to take care of their extensive trade.

Big Plant on the Coast.

A visitor to the Eastern country recently was M. F. Shaw, whom we met at Huntington the other day. He is general manager of the Sandstone Brick and Lime Co., of Seattle, Wash. They are putting in three kilns and expect to add a hydrating plant with thirty tons capacity. They will add Urschel-Bates bag machinery and have now installed a new American sand-lime brick plant of the Maroney brand and a new White press. They now have a capacity of 20,000 brick a day and will enlarge it to 40,000. Their operations are a short distance from Seattle on the Great Northern railroad. They have seventy-two acres of limestone which runs 98 per cent pure lime. They will apply fuel oil for fuel and expect not only to manufacture all the lime necessary in the sand-lime brick business, but also supply the Seattle market with a good grade of lime, which they are well equipped to manufacture, as far as stone and machinery are concerned.

Mr. Shaw, in speaking of business on the Coast, said that things were active and they were fortunate in being able to secure this lime property, which is scarce on the Coast, but being so near the market for both lime and sand-lime brick, they expect a large increase in business during 1907. Speaking of new uses for hydrated lime on the Coast, he said: "You know the fruit growers are catching the spirit and have started to use hydrated lime for sprinkling the fruit trees and it works fine as a fertilizer. There are many uses to which hydrated lime can be put and we anticipate a demand which will warrant our increasing our plant materially."

Will Enlarge Lime Capacity.

CHATTANOOGA, TENN., December 18.—The Chickamauga Cement Co. has taken steps to again enlarge its capacity to meet its rapidly expanding business in hydrated Portland lime, which is growing in demand every day. W. P. D. Morris, treasurer and general manager, says in regard to this increase in the trade: "We are receiving letters of commendation from those using this material throughout Eastern Middle and Southern States, from Massachusetts to remote points in Texas. The demand is chiefly for building block construction."

Building Three New Kilns.

GIBSONBURG, OHIO, December 1.—The Ohio and Western Lime Co., recently organized with a capital stock of \$1,000,000.00, with headquarters at Huntington, Ind., has been making extensive improvements at its plant at Genoa. The large plant of the company here is regarded as its most valuable possession and is said to be the finest constructed plant in the United States. Three new kilns are being built at Genoa and the hydrating plant is being remodeled.

Will Operate Old Quarry.

NORTH ADAMS, MASS., December 10.—A corporation has just been formed to manufacture lime at the Cole quarry in Richmond, where lime has been manufactured in a small way for fifty years, though not in recent years. The company is to be known as the Pittsfield Lime Co., and the officers are: A. B. Farnham, Pittsfield, president; A. L. Bowen and Ambrose Clogher.

MODEL HYDRATING PLANT.

Largest and Most Complete Equipment Designed by the Kritzer Co. for the
Dolese & Shepherd Co.

SPLENDID PRODUCT FURNISHED.

There is no better way to show the development of the hydrating branch of the great lime industry than to describe in detail a model plant which has just been completed and started into successful operation. It is at once the largest plant yet erected in point of size, the most complete in all its appointments and constructed without limitation as to cost where well approved economies were needed to perfect the plant.

This plant was constructed by the Kritzer Co., engineers and contractors, 17th and Western Avenue, Chicago, Ill., and its construction was under the personal direction of that well-known expert in hydrating propositions, Charles C. Kritzer, from the laying of the foundation to the turning over of the keys after every part of the plant had demonstrated its efficiency by practical operation.

The plant is located at Hawthorne, Ill., and constitutes a new and important department of the Dolese & Shepherd Co., who operate extensive quarries and burn dolomite lime upon a very large scale. The Dolese & Shepherd Co., by the construction of this plant secures the first lime hydrating plant at Chicago, the most progressive city of the age, and thereby they have assumed the leadership in their special line.

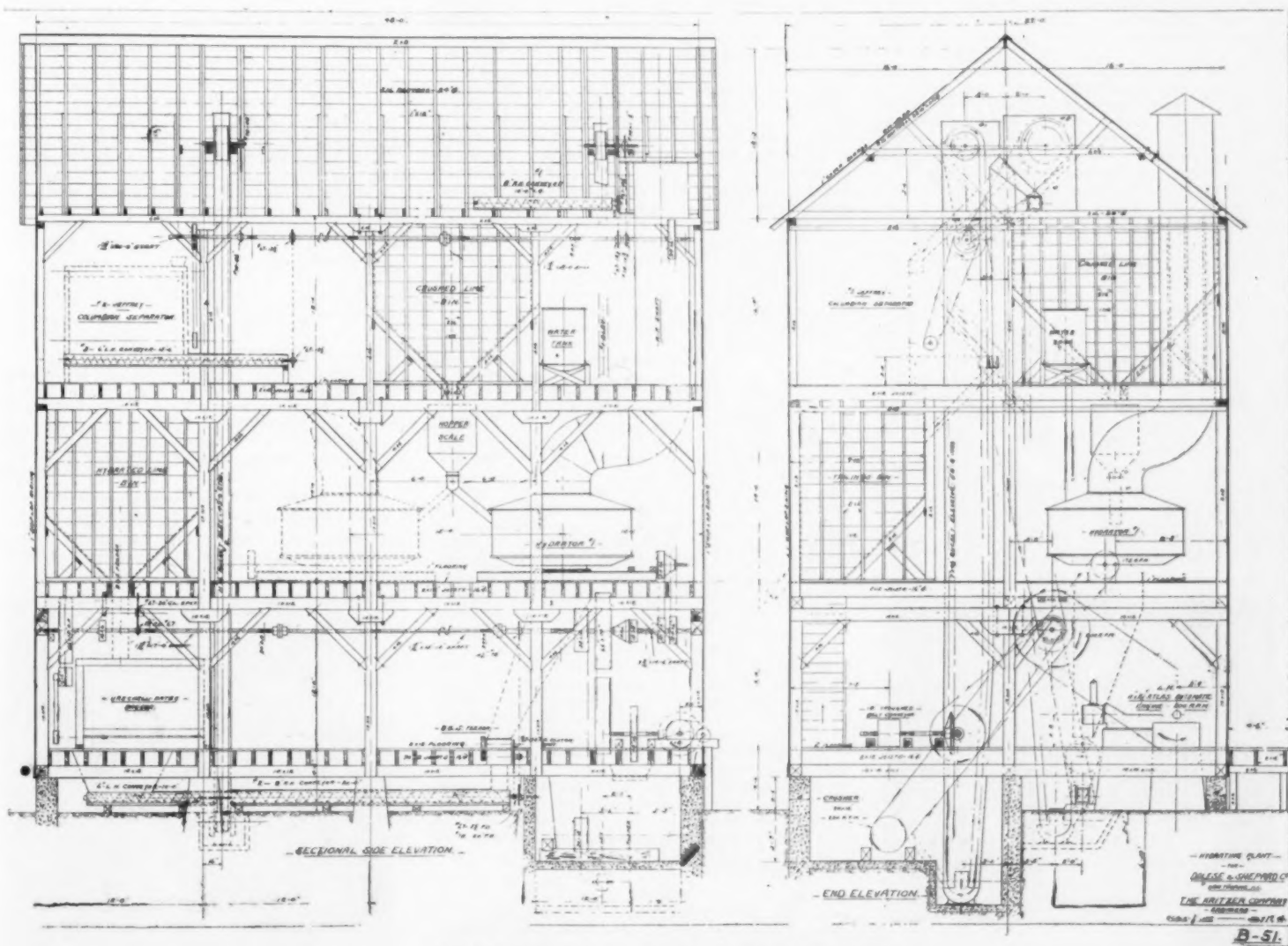


DOLESE & SHEPHERD CO.'S HYDRATING PLANT.

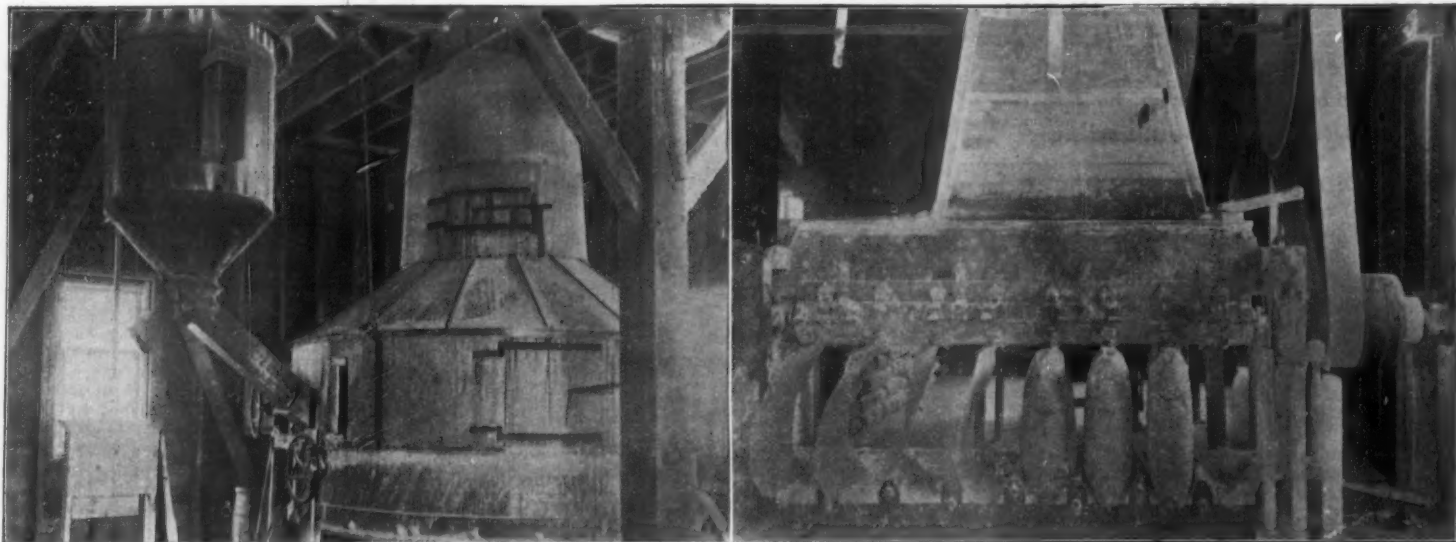
The drawings for this splendid hydrating plant, by the dictation of Mr. Kritzer, were approved August 10, 1906, and the construction of the three story and basement building and the assembling of the machinery was at once begun. The construction provides for the installation of two hydrating units, but the order was for the completion of a single hydrating unit with bin capacity, elevating and conveying provision and power equipment sufficient to double the capacity by merely installing an additional hydrating machine in space already provided to receive it.

The reproduced drawings shown in connection with this article explain in detail the construction and equipment of this great hydrating plant. There was not a hitch nor a check from the beginning until the perfectly hydrated lime was being packed into the automatic bagging machine, which reflects credit upon the designing and constructing engineer, Mr. Kritzer, and further it may be stated in this connection that the first pre-determined equation of the operation of the machinery was found to be the exact requirement both after the amount of water used in the hydrating of the lime and the speeding of the various elevating devices and separating appliances. The installation of the machinery began on September 15 and was fully completed October 10, without the changing or readjustment of a single lag screw or floor opening, so perfectly had the design covered every minute detail of the construction of the plant in advance.

The lime is introduced into the plant by means of an 18 inch belt conveyor furnished by H. W. Caldwell & Son Co., Chicago. This feeds the raw burned lime to a Sturtevant open door crusher of large size, delivering the ground lime to a Caldwell steel enclosed cup elevator which deposits it in the bin occupying almost one-half of the third story and immediately over the hopper which feeds by gravity into the Clyde hydrating machine. The hydrator is provided with a device which is arranged so that the contents of the huge iron drum can be weighed perfectly and this is so simple that the operator by merely shifting the indicator weight upon the steel yard bar has the weight recorded before him exactly after the fashion of standard platform scales. The Clyde hydrator is provided with a hood to prevent the outflow of fine particles of lime, and is also connected with a condensing stack where all the steam and vapor arising from the lime in process



PLAN OF THE DOLESE & SHEPHERD CO.'S HYDRATING PLANT.



CLYDE HYDRATOR IN OPERATION.

URSHEL-BATES AUTOMATIC BAGGING MACHINE.

of hydration are condensed in conjunction with the fine dust and when mixed with water returned again to the hydrator for the next batch.

In this way the temperature of the water introduced at the hydrator has been raised to 125 degrees F. approximately, which at once increases the capacity of the machine from 10 to 20 per cent and improves the quality of the product. This feature is a distinct innovation in advance of any of the other plants heretofore constructed and constitutes a distinct and tangible economy. The ground lime is fed from the bin to the hydrator in batches of 2,000 pounds. Then the water is applied in quantity predetermined by experience with the lime being handled by means of a spraying apparatus within the machine. Here the lime stays for a period approximating twenty minutes, all of which time the hydrator is revolving and the contained material is being violently agitated by means of the internal plows. Here the chemical reaction takes place and is so distinct that the operator can easily distinguish by means of a paddle when the fluffy, downy, perfectly dry hydration has been accomplished.

The hydrate is dropped from the hydrator into a bin provided immediately beneath and then fed through an automatic feeder and steel inclosed elevator of Caldwell make to a No. 2 Columbia screen separator furnished by the Jeffrey Mfg. Co. After screening which operation takes place on the third floor the now completed hydrate goes to a storage bin immediately below, which is just over an Urschel-Bates automatic bagger. The tailings at the screen are carried away with a screw conveyor and delivered through a chute outside of the plant. The packing department is also provided with a Silver Creek packer and the storage bins or final receptacle of the finished product of the plant are so arranged that hydrated lime can be fed to either or both the packer and automatic bagger. Just in front of the Urschel-Bates automatic bagging machine a grating has been provided in the floor where the operator

stands and beneath this a left hand screw conveyor carries any lime which may fall upon the floor by means of a defective bag or any error on the part of the operator back into the elevator which conducts it again to the screen so that there is absolutely no waste of finished material in the packing department.

All of the bins are lined with asbestos paper and sheet iron and closed in with just catches so that there is little or no dust about the plant when it is in full operation. Besides this a system of electric bells has been installed in connection with each of the bins for the purpose of warning the operator if any bin is too full and thus stops the mechanism which feeds into it. The whole plant is driven by an Atlas automatic engine of sufficient power to carry the full working load of the plant with ease.

Mr. Kritzer, the indefatigable engineer, is to be congratulated upon the successful completion of this, the greatest of all the hydrating plants, and Messrs. Dolese & Shepherd as well, upon having acquired such a splendidly profitable factor in conjunction with their large interests in Chicago. The hydrate being manufactured at this plant is a high grade dolomite lime, being burned with a special fuel which practically amounts to wood burned lime. It is approximately 30 per cent magnesia and one of the most beautiful hydrates that has ever been offered upon the market.

New Plant for Connecticut.

DANBURY, CONN., December 6.—Papers have been filed with the secretary of state, for the incorporation of the Stearns Lime Co., of Danbury, which is composed of Carroll D. Ryder, of Danbury, and Willis N. Stearns and W. E. Andrews, of Bethel. The capital stock is to be \$10,000.00. The company has secured control of the Jeremiah Mead farm in Beaver Brook, and has commenced the erection of a kiln. It is said that an exceptionally fine ledge of rock has been found. James Carson, formerly of the Atlas Lime Co., of Bethel, has been secured to take charge of the practical end of the business.

Improving Big Plant.

MOLINE, KAN., December 1.—The Moline Lime, Stone and Cement Co., has been making extensive improvements in its plant and when they are completed will have expended about \$50,000.00. They will have six new lime kilns, a stone crusher and a stone grinder to prepare limestone for use in the manufacture of glass. The railroad track will be lengthened and two new 75 h. p. boilers will be installed. The company has been burning lime in one kiln all summer, but say they can sell all they can produce with seven kilns. A ledge of lime rock 14 feet thick overhangs their plant and can be handled mostly by gravity.

Discover Limestone Ledge.

SAN FRANCISCO, CAL., December 15.—Recently H. S. Martinez and W. J. Martinez, two electrical contractors, of Berkeley, who live out on the old Rafael Martinez ranch, discovered a limestone de-

posit. This deposit is near the Orlinda Park in Contra Costa County, not far from the town of Berkeley. The lime is reported to be of the purest quality and the Martinez brothers will start tunneling at once into the main deposit. So far as can be discovered the stone appears to be inexhaustible. The ledge is four feet thick and is said to contain 98 per cent of lime. A large kiln is to be built and new machinery installed. The owners have received an offer from capitalists to sell out at a large figure, but have declined to part with the property. As the ledge is located so near transportation facilities, it promises to become of immense value. The demand here for lime is enormous and is increasing.

Preparing to Erect Plant.

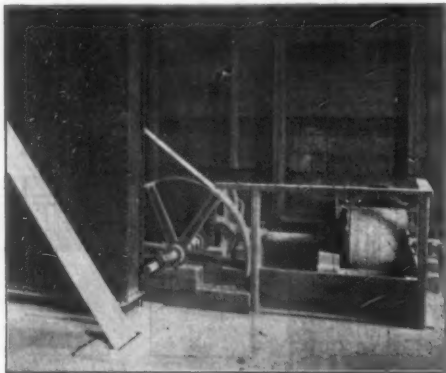
DAWSON, GA., December 18.—John R. Irwin and associates are about ready to begin the erection of a modern lime plant. They have a very fine limestone which analyzes almost pure calcium and they intend to equip with every modern appliance, both for the working of their quarry for a crusher plant and for their lime kiln. In connection with their operations they intend to install a hydrating department. They announce that they will be glad to receive the explanatory illustrated circular matter of machinery concerns catering to their especial line.

May Operate Lime Plant.

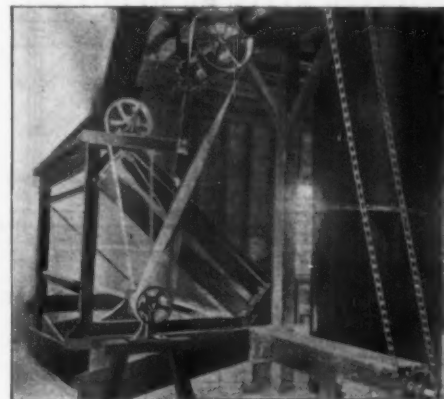
POTSDAM, N. Y., December 15.—It is reported that Henry H. Victory, of Utica, who recently bought the Rylstone marble quarry, three miles east of Gouverneur, will operate the quarry for the purpose of manufacturing lime. It is said that the material quarried is rich in lime.

Ready to Begin Operations.

SUGAR CREEK, OHIO, December 1.—The Canton Lime Works will soon be ready to begin operations at their new kilns and will employ between thirty and forty men.



BEGINNING OF THE PROCESS LIME DELIVERED TO CRUSHER BY BELT CONVEYOR ON RIGHT AND CARRIED TO HYDRATOR BY ELEVATOR ON LEFT.



THE JEFFREY SEPARATING SCREEN SIFTING THE PRODUCT BEFORE PACKING.

FUEL ECONOMY.

Lime Rock and Cement Clinker Scientifically Burned at Minimum Cost.

The fuel proposition is by far the most important factor in the cost of operating the plant for the manufacture of lime, plaster and cement. It is not many years since there was a choice between wood or coal as the fuel for all such operations, and in every case wood fuel had the preference for strictly calcining propositions where a low temperatured, long, mellow, steady flame was found by practice to be the most desirable. Of late years fuel wood has advanced so in price that the words, "fuel" and "coal," have well nigh become synonymous.

The first difficulty that made its appearance with the introduction of coal for calcining processes was the tendency to create a high temperature within a small zone near the furnace, in fact a neat much higher than that required, for calcining rock, while at a short distance from this neat zone of over-intensity there was found to be little or no heat produced, so that after burning a kiln of lime rock, for instance, which was properly charged for calcining by the use of a wood fire, it was found that the rock in the lower part of the kiln had been much over-burned, while a large proportion of the contents were badly under-burned, leaving only a small fraction of the charge to represent the properly calcined lime rock.

Many systems were tried, both in the method of charging the kiln by means of introducing layers of coke and the introduction of artificial drafts in order to secure the complete combustion of the coal that was placed in the firing box. Various attempts in this direction had various results upon the success of the operation and the character of the finished product. One result was always produced, namely, a large increase in the amount of coal consumed, for the introduction of artificial drafts meant an enormous increase in the speed of combustion which, of necessity, must be constantly supplied with fuel. The consequent increase of the fuel bill steadily advanced the price of production so that economies in combustion have been carefully studied and many have striven to make practical use of the waste gases as a means of fuel economy, but few apparently have understood very much of the nature of these waste products of combustion, for until very recently there have been no successful attempts made to use the waste gases for the purpose of creating artificial atmospheres best suited for the combustion of fuel for a given purpose.

There have been many attempts at heat conservation by the return to the fire box of heated waste gases, in order that the greatest amount of physical heat might be retained. What has become known as the Eldred process is a practical method of controlling combustion by the use of small, but regulated amounts of these same gases, mixed with the proper amount of atmospheric oxygen under perfect control. In the ordinary way a ton of coal will burn only about the same amount of lime as a cord of wood, although the coal has twice as much heat in it. The Combustion Utilities Co. show that with the Eldred process the full heat value of this ton of coal is obtained by producing from two to two and a quarter times the amount of lime that can be produced with the cord of wood. The calculation gives as high an efficiency as 5½ pounds of lime per pound of coal burned, which means that more than 85 per cent of the coal is used in the actual calcination of the limestone, while less than 15 per cent is lost in the heat of the escaping gases and through radiation. One firm operating by their process reports a saving of \$50.00 a week on each kiln. On dolomite rock as high an average as 200 barrels a day of lime has been obtained from a single kiln.

Burning of Cement Clinker.

Possible economies in the burning of cement clinker in long, rotary kilns is a feature of the deepest interest to the cement manufacturer, and in fact, one of the main factors which determine the factory cost of the finished article. Theoretically it only takes 25 pounds of coal to burn the clinker for a barrel of cement, while it is found in practice that the process requires from 90 to 120 pounds, according to the equipment of the

plant and the construction and condition of the kiln.

In the universal practice of using long, horizontal rotary kilns the fuel is injected in the shape of powdered coal mixed with air along the axis of the cylindrical kiln, necessarily developing its highest temperature in the line of the axis, while the material to be acted upon by the heat is constantly rolling over and over on the ascending side of the inner circumference as far as possible from the highest development of heat, so that the heat can only reach the material to be acted upon by radiation, which is certainly not the most economical application of heat.

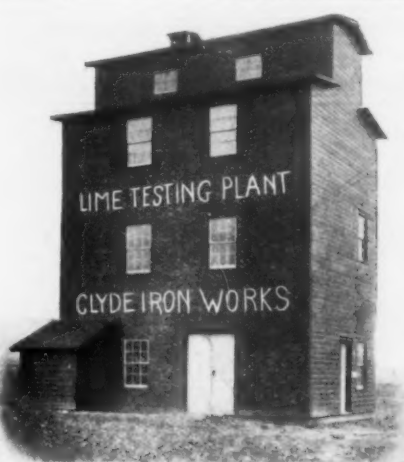
Heat should be developed at the point where it is to be utilized, if high efficiency is to be realized. For this reason a flame which strikes or impinges on the material has always been desired in the cement industry, and this the Combustion Utilities Co. alone claim to have accomplished. Former investigators who studied the subject of an impinging flame in the cement kiln have apparently worked with only a pure air blast, with the result that the flame produced invariably over-heated and destroyed the kiln lining, and all efforts heretofore have proved to be impracticable, so that cement burning with an impinging flame had come to be considered an insoluble problem.

Why it is impracticable to use pure air with impingement of flame will be seen from the following consideration: Only sufficient air for the complete combustion of the powdered coal should be supplied because any large excess of air means expensive loss of heat at the stack. These conditions in the cement kiln favor complete combustion, with practically only the theoretical amount of air. Combustion with nearly the theoretical amount of air means the development of a very high flame temperature which seemingly does no harm if axially burned in the kiln as the heat reaches the kiln walls under such circumstances only by radiation, and is therefore diminished in intensity. Should such flame impinge upon the kiln linings destructive action immediately ensues. The first practical impinging flame in the art of burning cement was introduced by Byron E. Eldred and has been thoroughly covered by letters patent of the United States and foreign countries.

This is the process of the Combustion Utilities Co., which conducts combustion in an artificial atmosphere, where the percentage of oxygen is modified to suit the particular heating operation, as it had been found impossible to conduct combustion economically in many instances by the use of atmospheric air containing 21 per cent of oxygen. In such artificially modified atmosphere an impinging flame capable of complete control and utilization is produced. This rational method permits of the generation of heat exactly where it is to be absorbed, with resulting economy of fuel of a substantial character. Further, as might be expected, an increased output of clinker is secured. The waste gases of the kiln itself afford the means for changing the atmosphere, in which the powdered coal is burned to the extent required for the production of the specifically calcining flame. The artificial atmosphere serves another useful purpose, that of lengthening the effective calcining flame.

Although relatively a low temperature operation, nevertheless calcination is best conducted, with a voluminous slow burning flame, possessing a certain luminous quality not heretofore found in the upper part of a cement kiln. This long flame, however, does not cause the gases to leave the kiln at a high temperature. Possibly the more rapid absorption of heat by the material acted upon precludes any increase in heat losses at the stack. A thorough consideration of the results obtained with this fuel saving process which are apparent in every case where it has been introduced, shows that the present tendency toward the lengthening of the kiln in the manufacture of cement, will mark the general adoption of the impinging flame conducted in an artificial atmosphere impoverished of a part of the oxygen as just described. All cement manufacturers appreciate how extravagantly wasteful of fuel are the present practices in cement burning, and the importance of this very improvement offered for their consideration.

In an early issue of *Rock Products* we will exploit an example of practical cement burning by the process described above, with full explanatory illustrations. The Combustion Utilities Co., 60 Wall Street, New York, will gladly take the matter up with interested parties in such a way as to fully demonstrate the economies that are to be secured by this latest improved system of combustion, in the capacity of practical engineers with uniformly successful records.



CLYDE TESTING MILL.

Lime Hydrate Testing Plant.

DULUTH, MINN., December 15.—The Clyde Iron Works, known throughout the lime industry as manufacturers of the Clyde hydrator, and designers and builders of hydrating plants, has recently completed an interesting testing plant. This plant is built on a small scale, but is complete in every detail and is being run exclusively for the purpose of testing lime for prospective customers.

The value of such a plant has been recognized for some time, but it remained for the manufacturers of hydrating machinery to build it. There is so much discussion regarding the advisability of hydrating various limes that only a practical demonstration will show what results can be obtained.

Many lime manufacturers are taking advantage of this opportunity to have a sample of their lime hydrated and the results are most gratifying. It requires ten barrels to make a test although twenty is considered better. The Clyde Iron Works conduct these tests free of charge, asking only that the lime man pay the freight. Thus for comparatively nothing, it is possible to find out exactly what kind of a hydrate any lime will produce and the resulting product can be tested out by masons and plasterers.

An electric motor furnishes power. The machinery consists of one Clyde hydrator, one Sturtevant open door crusher, one Columbia separator, an Urschel-Bates bagging machine and the usual elevators, conveyors, etc.

The plant is open at all times for inspection and is shown gladly to anyone interested in the lime business. It will undoubtedly be the scene of many valuable tests and experiments and no lime man should fail to avail himself of this chance to get the best information regarding the possibilities of hydrate in connection with his present business.

Hydrated Lime for Mortar.

We have found the following receipts for the making of mortar with hydrated lime, which are said to have been found to be of advantage by practical men using them in the East. Other readers of *Rock Products* may have different receipts and a general discussion along these lines is invited:

For first or scratch coat: Proportions—350 lbs. hydrated lime, ¾ yd. screened sand, 2 bushels hair. Should cover about 100 sq. yds.

For second coat: Proportion—200 lbs. hydrated lime, ½ yd. screened sand. Should cover about 100 sq. yds.

For putty or white coat: Use not more than one-half as much plaster to gauge up with as is commonly used with putty made from lump lime. If wall is very dry sprinkle or dampen with brush before putting on white coat as labor will be lessened.

For float finish: Proportion—300 lbs. hydrated lime, ¾ yd. screened sand. Should cover about 100 sq. yds.

For stone mortar: Proportion—200 lbs. hydrated lime, ¾ yd. screened sand. Mix dry and add water.

For brick mortar: Proportion—250 lbs. hydrated lime, ¾ yd. screened sand.



ANNUAL MEETING OF CEMENT MANUFACTURERS

New York was the place, December 10, 11 and 12 the time, and the new Hotel Astor, Forty-fifth Street and Broadway, was the scene of the largest gathering of the Portland cement manufacturers ever held in this country. The occasion was the fourth annual convention of the Association of the American Portland Cement Manufacturers, with representatives present from all parts of the United States, each company having three, four and in some cases five or six individuals present.

The executive committee held its meeting Monday evening at 8:30 o'clock, receiving reports of committees and electing new members.

The business meeting of the association was called to order at 10 o'clock sharp, Tuesday morning, December 11, with John B. Lober, presiding; Joseph Brobston, secretary pro tem, and C. Earle E. Bottomley, assistant secretary.

The following companies were represented:
Aetna Portland Cement Co.—J. A. Myers.
Alabama Portland Cement Co.—P. H. Moore.
Alma Cement Co.—C. A. Zehnder.
Alpena Portland Cement Co.—John Monaghan.
Alpha Portland Cement Co.—A. F. Gerstell, E. Hennessy.

Alsens-American Portland Cement Co.—W. P. Corbett, Max Cappus, E. Mueller.
American Cement Co.—R. W. Lesley, R. E. Griffith, C. M. Camm.
Bath Portland Cement Co.—G. W. Roydhouse, J. A. Horner, F. B. Franks, F. M. Hoover, B. F. Stradley.

Buckeye Portland Cement Co.—C. O'Donnell.
Buckhorn Portland Cement Co.—Abram C. Mott, J. W. Louder.

Castalia Portland Cement Co.—W. J. Prentice, J. W. Hackett, C. L. Johnson.
Catskill Cement Co.—J. W. Kittrell.
Chicago Portland Cement Co.—N. D. Fraser, D. D. Drummond, Mr. McDaniels, Mr. Turner.

Coplay Cement Manufacturing Co.—W. H. Harding, S. Y. Heebner, Chas. W. Saeger, Dr. Hartzell.

Dexter Portland Cement Co.—Conrad Miller, C. Weber Jones, Jos. Brobston, Richard K. Meade.
Edison Portland Cement Co.—W. S. Mallory, E. Meyer, W. H. Mason.

Empire Portland Cement Co.—H. S. Hayden, Mr. Moorhead.

German-American Portland Cement Co.—Fritz Worm.

Glen Falls Cement Co.—G. F. Bayle, F. W. Douglass.

Helderberg Cement Co.—T. H. Dumary, F. W. Kelly, C. H. Ramsay.

Hudson Portland Cement Co.—L. C. Smith, B. Bravender.

Iola Portland Cement Co.—E. R. Stapleton.
Ironton Portland Cement Co.—A. C. Steece.
Kansas Portland Cement Co.—G. E. Nicholson, A. B. Cockerill, L. C. Northrup, L. L. Stone, E. W. Stevens, Dr. L. Hunt.

Lawrence Cement Co.—E. R. Ackerman, L. V. Clarke, J. S. Van Middlesworth.

Lehigh Portland Cement Co.—H. C. Trexler, E. M. Young, C. A. Matcham, G. S. Sykes.

Marquette Cement Manufacturing Co.—T. G. Dickinson, W. Dickinson, N. W. Duncan, E. J. Dulton.

Thos. Millen Co.—D. Millen, W. H. Wiltse.

Nazareth Cement Co.—P. H. Hampson, M. J. Warner.

Newaygo Portland Cement Co.—D. McCool, N. J. Bell.

Northampton Portland Cement Co.—C. P. Jameson, H. A. Schaeffer.

Omega Portland Cement Co.—C. F. Wade.

Penn-Allen Portland Cement Co.—A. Barnes, W. R. Yeager.

Peninsular Portland Cement Co.—J. W. Shove, W. F. Cowham.

Pennsylvania Portland Cement Co.—A. H. Alker, W. N. Beach, R. E. Bonner.

Phoenix Cement Co.—W. Turner, G. W. Lamb, J. Zipperlein.

Sandusky Portland Cement Co.—S. B. Newberry, A. St. John Newberry, P. B. Beery.

St. Louis Portland Cement Co.—F. R. Bissell, H. Struckman, A. H. Craney.

United States Cement Co.—E. W. Shirk.

Universal Portland Cement Co.—E. M. Hagar, B. F. Affleck, M. Metcalf, J. G. Berquist.

Virginia Portland Cement Co.—W. R. Warren, D. E. Rianhard, S. R. Preston.

Vulcanite Portland Cement Co.—J. B. Lober, W. D. Lober, W. R. Dunn, S. W. Hartwell, Albert Moyer, T. G. Barr.

Whitehall Portland Cement Co.—T. M. Righter, W. C. Kent, H. B. Green, W. E. Erdell.

Wabash Portland Cement Co.—B. Duffield.

Western Portland Cement Co.—G. S. Bartlett, C. B. McVay.

Western States Portland Cement Co.—T. F. McClaren, N. S. Potter, Jr.

Wolverine Portland Cement Co.—E. R. Root, H. Bastianelli, C. H. Wood.

The affairs of the association have been running so evenly and smoothly, that there was little to do but to elect two new companies, the Buckeye Portland Cement Co. and the Louisville Cement Co., making a total of six companies, to join the association since the September meeting, the Ironton Portland Cement Co., Buckhorn Portland Cement Co., of Utah, and Portland Cement

Co., of Denver, Col., having been elected at the November meeting of the executive committee.

After receiving the reports of officers and various committees, the association as a body proceeded to the election of officers and an executive committee, with the following result:

President—John B. Lober.

Vice President—C. F. Wade.

Treasurer—E. R. Ackerman.

Executive Committee—R. W. Lesley, T. H. Dumary, E. M. Hagar, A. F. Gerstell, Conrad Miller, Deaune Millen, N. D. Fraser, W. H. Harding, E. M. Young, W. R. Warren, S. B. Newberry, G. E. Nicholson, to serve for the ensuing year.

The business meeting then adjourned, and as there were no technical papers to be read, the members were advised of the banquet arranged under the directions of Messrs. Warren, Hagar and Ackerman, the entertainment committee, to be given at 7 o'clock that evening.

The banquet was a huge success. Nearly 130 gentlemen were seated at the festive board. Business was forgotten; competition among the individual companies seemingly had never nor would ever exist; the salesman, the superintendent and the president of the various companies representing the investment of many, many millions of dollars were handshaking, laughing and chatting, meeting as man and man.

Just at the close of the Tuesday's business of the association some mention was made as to just what the North American Cement Co.'s position was in the cement world, some of the members, in fact quite a number, having not had full light on the new company just organized. The association meeting was adjourned, and the individuals present were given an address by Messrs. Lesley, Gerstell and Lober, three of the incorporators of the new company, setting forth fully the exact purpose of the new corporation, a synopsis of which will be found in these columns.

The president of the association has now been elected for the third time, and it is fitting to say, echoing the sentiments of every cement manufacturer in the United States that no man is better qualified to lead men nor to so ably fill the position of presiding officer than John B. Lober.

After the informal smoker Wednesday morning among the wine casks containing the products of rare old vintage, the members left for their respective homes, thoroughly satisfied with themselves and the world at large.

NOTES OF THE MEETING.

Not only was the attendance the largest gathering of cement men ever held, but the machinery men, building supply men and pulverizer men were on hand in bunches to help the good cause.

Leslie Bennett, from Buffalo, was looking 'em over and met many of his old friends.

Cleveland and Cincinnati had two representative supply men in W. E. Viets and W. W. Coney, respectively.

Our old friend Deaune Millen, who has missed the last two meetings, was present with his right bower, W. H. Wiltse.

It seemed like old times, very much Atlantic City as it were, to have "Jack" Myers on from Detroit and on his native heath.

New York is certainly a grand old town.

J. W. Fuller and his two able assistants, R. S. Weaver and H. G. Barnhurst, were explaining the merits of the Fuller-Lehigh Mill, with a small working model and every one was welcome to see the mill at work.

Classic music was dispensed during the banquet and was fully up to standard specifications. Caruso did not attend in person, but puns in regard to the gentleman were very much in evidence.

Jolly Fritz Worm sailed Thursday morning for the Faderland, and if well wishes have anything to do with the case, safe voyage will be the result.

The Bath contingent were there in full force. President Roydhouse had just arrived from Havana, looking the picture of health.

Ole Alabam' has been absent since September, 1904, but fell right in with the jolly crowd. P. H. Moore was the representative and was immensely entertained.

Among others who made their debut were C. O'Donnell, of the Buckeye; C. A. Zehnder, of the Alma; W. H. Mason, of the Edison, and B. F. Duffield, of the Wabash, and as debutantes, they are willing to repeat the performance.

C. M. Lauritzen, of the Raymond Pulverizer, made a short stay; just visited, didn't talk shop and was off to Philadelphia en route to Chicago.

Genial Charley Wade was kept busy handshaking and re-echoing, "Glad to see you!" Real, sincere friends are rare, but Charley has a multitude of them.

Everybody was glad to see everybody else. F. H. Angell, of the Jeffrey Manufacturing Co.; W. C. MacEwen and Wm. D. Craven, Jr., of Allis-Chalmers; F. E. Anthony, the Cleveland bag man; C. H. Claiborne, the Mt. Savage fire-brick representative, were in and out the throng.

It would have required more than one automatic weighing machine to measure the good fellowship and geniality that existed, but D. G. Dearborn was there from Newark to look after that end of the game.

The memo pads distributed by F. E. Anthony, of the Cleveland Bag Co., are neat, attractive and useful.

"Saylor's" is the standard, which Col. Harding is marching under, and with Messrs. Heebner, Saeger and Hartzell presents a strong combination.

Representatives of the Iola and Kansas companies were present, and while thoroughly interested in all the business proceedings and jollifications, feel justified in patting themselves on the back, owing to their gas proposition for burning.

Col. Trexler, and his able lieutenants, Messrs. Young, Matcham and Sykes were on the firing line from the start to finish, and no matter how late to bed, were the first to arise in the morning.

September's illness has left no trace on either G. S. Bartlett or Charley Wood, both of whom were in fine fettle and busy receiving congratulations on recovery.

It was the first offense of the Western States Co. representatives, and judging from the reception accorded them, every meeting will have this company answering the roll call.

The representatives of the "Universal" Portland Cement Co. are universal favorites, both in business and social circles, as was evidenced at all times during the meeting.

The dean of the faculty, R. W. Lesley, was first on the ground and among the last to leave, discussing business one minute, handshaking the next, appreciating a joke the next, and always on the alert.

In the executive chair, during the banquet, and in fact, at all times, there is one man who is always himself, and who thus commands the confidence of others, John B. Lober, president.

Many were the exchanges of "Merry Christmas" between the members, some of whom will not see each other until the March, or possibly the June meeting of 1907.

Owing to a misunderstanding there was some talk of a disbandment of the association on Monday evening. When one considers the good that has been done by the association in its short life, the elimination of enemies previously existing in the industry before its formation; the settlement of the bag question; the adjustment of trade conditions, and the many, many betterments to the manufacturers and the industry in its every phase, it at once becomes apparent that with the many years of prosperity before us, now is the time when we really need the association more than at any other period of its existence.

Exhibit at Jamestown Exposition.

With the passing of the old year goes the largest production of Portland cement in the history of the country. The foreigners now visit our shores to see how we do the thing on which a few years back we were looking to them for information.

Early in the New Year, we will have the commemoration of the 300th anniversary of the first English settlement on the American continent—the Jamestown Exposition. The occasion promises to be one of the grandest affairs the New World has seen.

Growing as we have in all pursuits, in all industries, in everything, the exhibits that will be presented to the visitor are impossible to be conceived by the most vivid imagination, and that they will be viewed with interest by many thousands of our eighty millions of population, and will long be remembered, is a foregone conclusion.

What material has made such gigantic strides in all fields of structural and ornamental work as cement and the varied products therefrom have? What material has the pliability, the durability, the reliability? Under the most exacting conditions, Portland cement stands alone upon the highest pedestal.

Every exposition of late years has seen advances in the exhibits made by cement manufacturers and those having to do with the workings of the material. The Government Testing Laboratory at St. Louis, the former exhibit of the association of American Portland Cement Manufacturers, and the exhibits of the individual manufacturers were well thought out, well planned, well executed.

Of course this is the age of cement, the uses are many fold, but even at this late day large majority of the inhabitants of our wonderful country not only do not know the use to which cement is adapted, but have no conception of the meaning of the word.

It therefore certainly behooves the cement manufacturers of this country, individually and collectively, to make an early start, and have Portland cement presented to the notice of the visitor intelligently, concisely and practically. It is due the citizens of our country to have knowledge of what is the best material for the construction of their homes, or the construction of huge edifices, dams, or what not which enable them to enjoy earthly existence. It is due the manufacturer that his product should receive the recognition that it has so ably earned.

This is something that should receive thorough care and intelligent thought, and an early start means the time and attention that should be given thereto.

Correction.

In our issue of November 22, page 38, first column, under heading, "Has Had a Large Trade," we stated that the contract for furnishing the cement for the Butler Bros. Building, St. Louis, Mo., has been awarded to Mr. Cobb. We have been advised of the error in this statement, which was inadvertently made, and hasten to correct it. Every barrel furnished under the contract for the building in question, some 60,000 barrels, is the Red Ring brand, manufactured by the St. Louis Portland Cement Co.

David Trainer has resigned as president and general manager of the Alma Cement Co., and will enter the contracting business.

Cement Works to be Abandoned.

BUFFALO, N. Y., December 20.—A report from Akron, N. Y., says: "Thomas B. Lockwood, of Buffalo, who owns the Akron Cement Works, reports that the works will not be operated again in the manufacture of cement. The mills have been idle for the past year, being the longest time in the history of the works. Competition and the general use of Portland cement, is the cause of the complete abandonment of the enterprise. During the past few weeks men have been busy taking up the car tracks leading to the kilns, also gathering all iron from the surroundings, which is a well-grounded reason to believe that the Akron Cement Works will soon become a thing of the past."

New Plant in Alabama.

SELMA, ALA., November 27.—The Winona Portland Cement Co., has been organized with a capital stock of \$1,000,000.00 to erect a Portland cement plant at Epps, Ala. The plant will have a capacity of 1,500 barrels daily, and will be erected at a cost of \$300,000.00.

The officers are: President, A. G. Parrish; vice president, J. P. Wetherbee; treasurer, Houston Armstrong; assistant treasurer, J. P. Wetherbee. Directors, J. P. Wetherbee, W. Cater, Jr., W. M. Vaughan, J. F. Hooper and N. Waller.

Big Fire Loss.

PITTSBURG, PA., December 7.—The buildings of the International Portland Cement Co., at the lower end of Elizabeth, were damaged to the extent of \$300,000.00 by fire this morning. The plant has been in operation since January last, and about 100 men were employed in the manufacture of cement. The plant is owned by Philadelphians and it is stated that repairs will at once be made and the plant put in operation for the coming season's business.

Trying to Buy Up Stock.

IOLA, KAN., November 28.—Sheldon H. Bassett and E. R. Ryan, secretary of the Iola Portland Cement Co., have been in the Detroit, Mich., market endeavoring to purchase the outstanding common stock of the Iola Co. at par. The company owns 1,500 acres of cement land, in addition to its extensive plant, and the confidence of the company's officers in their own proposition is thus shown in their endeavor to purchase additional holdings of the stock.

Takes Over Reading Plant.

READING, PA., December 6.—The Vindex Portland Cement Co. has just been incorporated by John R. Miller, Chas. T. Nagle, John C. Illig, Robt. F. Wentz and Charles F. Lawrence, who have also been chosen as directors to serve the first year. The company is capitalized at \$25,000.00 to take over the property of the Reading Cement Co. and operate the plant which has a capacity of 600 barrels a day.

Plant for Southern Ohio.

COLUMBUS, OHIO, December 3.—Southern Ohio is to have another large cement plant to be built at Portsmouth, Ohio, by the York Portland Cement Co., of which L. D. York is president and Dudley Hutchins, general manager. The company is capitalized at \$500,000.00 and the initial daily capacity of the plant will be 1,000 barrels to be increased as soon as machinery can be procured, to 2,000 barrels.

Ground Broken for Plant.

RIVERSIDE, CAL., December 7.—Ground was broken to-day by the California Cement Co., for the erection of a 5,000 barrel Portland cement plant at West Riverdale. The company has a capital of \$2,500,000.00 and will have a spur connecting with the Southern Pacific Railroad.

Big Contract for Carolina.

CHARLESTON, S. C., December 5.—One of the largest cement contracts closed recently is for the city of New Orleans, which is to put in a \$10,000,000.00 purification plant at Algiers, and has just ordered 440,000 bags of Portland cement from Mr. Frank C. Ford, of the Carolina Portland Cement Co.

Will Resume Operations.

HALIFAX, N. S., December 1.—After several weeks of idleness, during which the entire plant was overhauled, the Sydney Cement Co. will resume operations. The company manufactures a high grade puzzolan cement and has had a successful season.

Ground Broken for Plant.

ALPENA, MICH., December 15.—Ground has been broken for the erection of a 3,000 barrel Portland cement plant on the Avery mill site, by the Huron Cement Co., in which J. B. and E. L. Ford are interested. The company is capitalized at \$1,200,000.00 and will commence active building operations in the early spring.

Heavy Cement Deliveries.

BANGOR, ME., November 26.—As a result of the great amount of building that has been carried on in Bangor, the cement deliveries into this place will amount to some 70,000 barrels. Bangor usually consumes from 12,000 to 20,000 barrels of cement yearly; last year the figures rose to 65,000 barrels and this year the figures have been considerably increased.

Largest Gas Producer Plant.

DALLAS, TEXAS, December 17.—The new plant of the Iola Portland Cement Co. will have the largest producer gas installation in the world. Both gas and steam engines have been employed at the other plants of the Iola company, and their decision in this instance was influenced by the saving in fuel consumption in the adoption of gas for power purposes. Bituminous coal and Texas lignite will be the fuels used.

Dr. Bachman Buys Plants.

EASTON, PA., December 5.—The plants of the Northampton Portland Cement Co., at Stockertown, Pa., and the Quaker City Portland Cement Co., at Sandt's Eddy, have been purchased by Dr. Irvin A. Bachman, who has also lately acquired the property of the Atlantic Cement Co., at Friedenthal. Dr. Bachman was the original promoter of the Nazareth Cement Co., and has also erected a plant at Napa, Cal., which is being operated successfully in the manufacture of high grade Portland Cement.

Favor Operation of Plant.

DETROIT, MICH., December 5.—A meeting of the bondholders of the Great Northern Portland Cement Co., has just been held and action decisively taken favoring the operation of the plant. Orders for the issuance of receivers' certificates have been asked the United States Court for this purpose. The company is capitalized at \$4,000,000.00 and the plant is said to have cost \$1,000,000.00. The Michigan Trust Co., of Grand Rapids, Mich., is the receiver.

New Plant for Louisville.

LOUISVILLE, KY., December 7.—A plant for the manufacture of Portland cement is to be established just below Brandenburg, near the quarry of the Kosmos plant. Urban C. Brewer and Eastern associates are interested, and have purchased 800 acres of limestone property on which it is intended to erect a modern plant of 1,000 to 1,500 barrels daily capacity.

The transportation facilities of the new plant will be excellent. In addition to ample river transportation, arrangements have been made for the construction of a spur of the Louisville, Henderson and St. Louis railroad.

One More for Kansas.

COFFEYVILLE, KAN., December 3.—At a meeting of the stockholders of the Dewey Cement Co., the following officers were elected: President, P. E. Tyler; vice president, F. L. Williamson; secretary, J. H. Keith; treasurer, J. R. Mulvane; assistant treasurer, C. M. Ball. The company is capitalized at \$2,000,000.00 and will at once erect a mill of 2,500 daily capacity at Dewey, near this place.

Mr. Tyler, the president and general manager of the plant, was until recently treasurer and general manager of the Indian Portland Cement Co., of Neodesha. W. H. Hess, former superintendent of the Indian Portland Cement Co., is in charge of the construction of the plant, which will start at once.

North American Cement Company.

NEW YORK, December 5, 1906.—At a recent meeting of the directors of the North American Portland Cement Co., the following officers were elected: President, R. Rogers Maxwell; secretary, John B. Wight; treasurer, Edward M. Young; vice presidents, John B. Lober, Howard M. Maxwell, Robert W. Lesley, Henry C. Trexler, Ernest R. Ackerman, A. F. Gerstell.

The purposes of this new company were fully set forth in the last issue of Rock Products, but for the benefit of those who may have a misunderstanding of the facts the following may be of interest:

The company has acquired the exclusive control of U. S. Letters Patent Nos. 645,031, dated March 6, 1900, to Hurry & Seaman, for apparatus for burning pulverized coal, and 691,336 and 691,337, Dated January 14, 1902, to Carpenter for process and apparatus for feeding fine fuel, together with the right to grant licenses thereunder and to settle of release claims for profits and damages for past infringements.

Licenses for the manufacture of Portland cement under the patents above referred to have been granted to the Lehigh Portland Cement Co., the American Cement Co., the Alpha Portland Cement Co., the Vulcanite Portland Cement Co., and the Lawrence Cement Co., of Pennsylvania.

The company will also build additional Portland cement plants in portions of the country where they are required, but there is not a combination, as has been intimated in various daily papers, of the various companies that have become licensees of the North American Portland Cement Co., nor any intention to limit the output of cement to boost prices.

With Chicago Cement Makers.

CHICAGO, ILL., December 20.—The cement manufacturers here are "resting on their oars." While the mills are all running and will probably continue until after January 1 when they will shut down for repairs, little cement is being sold. The building season is at an end and most of the salesmen are in from their territories. Nearly all the mills represented here report that they will make extensive changes and improvements at their mills during the shut down in order to increase the output as everyone around here is confident that 1907 will be a greater cement consuming year than 1906.

The Marquette Cement Manufacturing Co., will build a new mill building at their plant at La Salle, Ill. This company is issuing a new seventy-two page catalogue on Portland cement in general and Marquette in particular. The catalogue will be of value to the dealer in cement for a reference book. It contains several pages on how Portland cement is manufactured, the different uses it can be applied to, the proper mixing for its different uses, several pictures of buildings in which Marquette cement was used in large quantities and much other pertinent matter relating to cement that every one handling it should know. The book will be sent on request.

The Chicago A. A. Portland Cement Co., will make several additions and improvements at their Oglesby mill. They have already placed orders for seven tubes mills 5 ft. 6 in. by 22 in.; two revolving dryers and one set of 36 in. Superior rolls with the Power and Mining Machinery Co. They have also ordered from the Kent Co., several Kent mills.

The German-American Portland Cement Co. will add much new machinery during the winter and make improvements to increase their capacity for 1907.

Our genial friend C. H. Ford, of the Kosmos Portland Cement Co., has just left ole Kaintuck for Summerville, S. C., where he will endeavor to bag a couple of deer that are now tied in the woods near Charleston. If he is as successful in landing deer as he is in bagging orders, venison will grace the plates of his many friends upon his return.

A recent Louisville visitor and caller at the Rock Product sanctum, was Herbert J. Wallace, of the Carolina Portland Cement Co. Mr. Wallace returns home for Christmas, but talks Dehydrata volubly and our recent weather makes a fellow sort of yearn for it.

The Busy Jap.

According to late reports of Vice Consul General E. G. Babbitt, at Yokohama, it has been agreed among the capitalists of Kobe to organize a cement manufacturing company with Japanese and Chinese joint capital. The promoters are Woo-Ching-don, Mak Sui-Pan, Takigawa Benzo, Kanemutsu Fusajiro, Matsukata Kojiro, Kawanishi Seibel, all of Kobe, and Yu Hsia-ching, of Shanghai, who has important relations with the railway industry of China. \$250,000.00 is the original capital of the company. The Japs are progressive sure, but with such a collection of names, we are awaiting with interest the brand that will be adopted.

Preacher on Portland Cement.

ST. LOUIS, Mo., December 20.—A social dinner attended by men whose common point of interest centers in the fact that they are members of the same religious body, is about the last place where one would expect to hear a speech regarding Portland cement. Yet at such a gathering a few days ago a large crowd of men assembled at a banquet, listened to an after-dinner speech by a St. Louis missionary, who discoursed both eloquently and learnedly on concrete blocks and their adaptability for the construction of churches and schools in outlying districts. This particular missionary is his own mason and carpenter, for which he does not charge or receive union wages, but perhaps the suggestion may be of use to the regular makers of blocks who are looking for markets that will increase the demand for their product.

A Cement for Use in Sea-Water.

Portland cement, as is well known, is very injuriously affected by sea water. The researches of LeChatelier, Deval and Dr. Wm. Michaelis, Sr., have shown that this injurious action is due to the formation of sulpho-aluminate of lime, by the action of the sulphates of the sea water on the alumina compounds present in the cement, and that cements practically free from alumina are not injuriously affected by sea water. Dr. Michaelis found it possible to produce a true Portland cement on an industrial scale, by the substitution of oxide of iron for alumina in the raw mixture. Mixtures so prepared, consisting of silica, iron oxide and lime, burned rapidly to a normal clinker, give on grinding, a dark colored, slow-setting Portland cement, fully equal in strength and hardness to ordinary aluminous Portland cement.

Tests made at the Charlottenberg Experiment Station, at Charlottenburg, Germany, show that cement of this character, even when mixed with 30 per cent of its weight in gypsum, is entirely unaffected by sea water. This cement, known as "Ore Cement," is manufactured by the Hemmoor Portland Cement Co., of Germany, and it is proposed to establish the manufacture of the same in the United States.

James L. Bernard, formerly selling agent for the Alma Cement Co., is now connected with the Edison Portland Cement Co.

The Government of Costa Rica has announced a decree that Roman cement will be admitted free of duty after January 1, 1907.

Dr. J. D. Erdman, is president, and C. D. Strauss is secretary and treasurer of the Allentown Portland Cement Co., just organized with a capital of \$2,000,000.00, to build a large plant on the Lehigh Valley railroad, about six miles north of Allentown, Pa.

The plant of the New York Cement Co., at Rondout, New York, was destroyed on December 13, causing a loss of \$250,000.00. Two hundred men are thrown out of employment.

Frank Durkee, a prominent lime operator, of Durkee, Ore., is interesting capital in the establishment of a Portland cement plant in that vicinity.

The Union Portland Cement Co., at Rushsylvania, O., will remain closed until January 1, 1907, to permit further repairs made necessary by the explosion some months ago.

The American Cement Co., of New Jersey, has decided to make the par value of its stock \$50.00 instead of \$10.00, in order to make their stock more attractive from a trading point of view, as a movement of $\frac{1}{4}$ with a price of 10 would equal a change of $1\frac{1}{4}$ on a basis of 50.

HOW CEMENT IS MADE.

Brief Description of Manufacture of Great Building Material From Quarry to Storehouse.

INFINITE CARE REQUIRED OF MAKERS.

The substantial virtues of Portland cement, now ranking in point of production with the iron and steel industries of the country, have been well covered in the literature on the subject that has grown to immense size, especially during the last five years. Experiences of leading scientific and practical men of this country, as well as translations of foreign writers, are included in the vast field of literature, which has been of great value in aiding the wonderful growth and enormous consumption of the material.

Portland cement has so thoroughly demonstrated its right and title to the foremost position it occupies as a building material, has been so sorely tried and not found wanting, that the occasional complaints of partial failure or unsatisfactory results, are not due to the failure of the material itself, but rather to carelessness or gross negligence on the part of those having to do with its practical use.

This is due in a measure to the average American's "hurry and rush ahead" spirit; the attempt to skim hastily over descriptions or writings which are necessarily lengthy in order to be complete, or the disregard of the fact that every material has its limitations, irrespective of how wonderful a material it is.

It is with the hope that all those having to do with the use of Portland cement, will understand just what Portland cement is, how it is manufactured; the extreme care and judgment that is exercised in its manufacture, and will employ corresponding care and judgment in its use, that a brief, condensed story of the manufacture is written.

Character of Materials.

The raw materials for the manufacture of Portland cement exist in practically all parts of the United States and include a great number of substances containing lime, silica and alumina, such as limestones, argillaceous (clayey) limestones, cement rocks and marls. Shale and clay containing silica and alumina are added to these materials to produce the argillaceous or clayey requirements, with the exception of cement rocks; to the later, additional lime is required to be added to arrive at the proper limit. After finding these materials and theoretically demonstrating their adaptability to the manufacture of Portland cement, an element of risk exists until the material is in its finished condition ready for use in the building world. Numerous instances may be cited where the samples of cement made in the scientific laboratories by expert chemists have theoretically proven all that could be desired, yet have failed dismally in practical work, after a plant involving the expenditure of many thousands of dollars had been constructed.

Locating a Plant.

Granting the raw materials to be all that is desired, the establishing of a cement plant depends not only upon the raw materials, but also upon transportation facilities, both for economical fuel and accessibility to the markets of consumption at figures low enough to meet competition. The problem that now confronts the manufacturer is the excavation and conveying of the raw materials to the starting point in the preparation of the proper mix or "composition" to be burned in the kiln.

Mining and Handling Raw Materials.

Limestones, cement rocks and hard shales are mined in open quarries or in tunnels. Most of the quarries are open faced and the methods are those ordinarily used in limestone quarries, with the attendant danger and requisite exercise or care in drilling and blasting.

The rock as it is blasted, is picked up and conveyed by steam shovels to the "composition" side of the mill. Steam shovels are also used in the

case of soft shales, semi-dry marls and clays. Very wet marl, such as is used by many of the Michigan mills, is excavated from the bottom of lakes by dredges.

Not only must there be considered the most economical methods for mining and securing the proper character of materials, and for their delivery to the mixers or dryers and continuous analyses made of these materials as they are mined, but it is also necessary to have at all times on hand at the "composition" side of the mill sufficient quantities of materials to check up these analyses, and meet any unexpected delays in the supply caused by breakdowns in machinery, accidents, storms, etc. For this purpose, storage buildings are provided in which waste heat is utilized to expel the natural surface moisture of the stones or clays before the requisite drying process preparatory to the grinding.

The proper raw materials have now been brought together at the "composition" side of the mill; the next step is the preparation of the "composition."

Preparing the "Composition."

The dry limestones and cement rocks are crushed in either of the well known forms of gyratory crushers and the crushed material is placed in dryers to eliminate any possible moisture. The two materials are either crushed separately and then mixed together in powdered form, or, after being weighed and proportioned, are placed together in a crusher in which a preliminary mix takes place. In the case of marl and clay, the materials are handled as they come from the beds or pits, and after being proportioned by weight, are run into mixers of various forms. Where the clay is added to the marl at a later stage of the process, it is dried in a rotary dryer. The dryer consisting of a long iron cylinder travelling in a brick fire-chamber at one end. The clay after drying is pulverized, properly weighed and thoroughly mixed with the marl.

The ordinary mixing in tanks or pug mills is not deemed sufficient to arrive at the most intimate mix, and as uniformity is the governing factor, the materials are ground together. This is the most costly, but is deemed the best method of arriving at this result.

The "composition" is now run into a tank where it is constantly agitated in order to keep it at the proper consistency; samples from these tanks are analyzed; if the analysis is not satisfactory, it is run into homogenizing tanks where the requisite ingredients are added to the mix. If the analysis is satisfactory, the composition is run into smaller tanks or hoppers above the rotary kilns.

A Most Important Feature.

The preliminary grinding is one of the most important features, especially in the case of dry materials, as the character of the clinker produced and also the finished cement is dependent upon the fineness of this composition, and to obtain the most intimate mixture where the dry powder is to be placed in the rotary kilns, the grinding must be most thorough to bring the composition down to a flour-like powder.

The absolute dryness of the rock to be ground is of the utmost importance to avoid choking the screens, clogging the mills or in any way delaying the course of manufacture. In order to accomplish this extremely fine grinding of the raw material as it comes from the dryers, various forms of crushers and grinding rolls are in use, requiring the heaviest of shafting, belting, huge power, etc.

Approximately 625 pounds of limestone and cement rock, or 1,300 pounds of wet marl and clay are handled to produce 380 pounds (one barrel) of Portland cement, and it can readily be seen that extreme care and judgment is necessary to handle the material with the greatest efficiency at the smallest cost.

Burning the "Composition."

The "composition" is now ready for burning in the rotary kiln now in use in all modern plants in this country, which, briefly described, is a cylinder lined with fire-brick, about 120 ft. in length, supported by trunnions and trained by gears, with a diameter averaging 6 ft. 6 in. at the chimney end, and 7 ft. at the discharge end, with a daily average capacity of 450 barrels; the fuel consumption averaging about 100 pounds to the barrel, where dry material is used, and considerably more with wet material.

Pulverized coal is the fuel in general use in the modern mills of the United States, with the exception of plants located in Kansas and other natural gas district, and we will deal with coal as the fuel element.

The marl and clay (wet) composition is fed from tanks into a stack at the upper end of the kiln. The kiln makes about one revolution every two minutes and is inclined from the feed stack to the discharge end. This lower end of the kiln projects into a hood or shell which protects the burner and regulates the air. In the hood are nozzles through which the pulverized coal is driven by blast, the pressure of which is regulated by the burner. The composition starting from the feed stack at the upper end of the kiln works its way down to a point near the discharge end, called the fire zone; the powdered coal enters the heated kiln and is transformed into gas; the flame goes through the kiln, drives out the moisture and carbonic acid gas at the upper end and thoroughly calcines the material in the fire zone.

The rock (dry) composition is fed in the form of flour-like powder into the upper end of the kiln from hoppers above the kiln; the burning or calcination takes place under practically the same circumstances.

After calcination the clinker drops into endless chain conveyors under the discharge end of the kiln and is carried to large iron coolers subjected to forced draft in which the material as it falls is cooled. In some instances, a steady stream of water falls upon the hot clinker in the buckets or cups of the conveyor, immediately as it leaves the discharge end of the kiln and aids in the cooling as it is on its way to the cooling tower.

It is highly important to cool the clinker sufficiently for proper grinding, as it changes greatly in its characteristics and fineness, according to the time it has been exposed to the air after calcination.

Grinding the Clinker.

Two methods of reducing the clinker to powder now confront the manufacturer. If it is decided to use the ball and tube mills in batteries, the clinker is fed immediately in the ball mill which acts as a breaker for the tube mill and the latter crushes and wears down the material until the desired fineness is obtained. On the other hand, if it be desired to use any of the many forms of gyratory mills to produce the finished product, it becomes necessary to first prepare the material in one of the various forms of huge coffee-mill crushers which gradually reduces it to the proper size for the best operation of the particular finishing mill to be used.

The many difficulties that have been overcome to arrive at the present stage of perfection in crushing and grinding, both the raw materials and the clinker to the fineness obtained at this time, is a history in itself and would require many columns to be set forth in its entirety—hence its omission.

Coal Grinding.

The foregoing description of the grinding machinery, also applies to the preparation of the pulverized coal for use in the rotary kiln. This grinding is usually done in a separate building provided with ample ventilation and headroom, in order to avoid danger from explosion or fire. Ingenious draft arrangements are in use at the individual plants of the country to keep the atmosphere in the coal grinding department as free from flying particles of pulverized coal as possible. The coal, after being subjected to the drying process similar to that of the raw materials, is run through one of the many forms of gyratory mills and reduced to powder, in which form it is introduced into the kiln.

Storing the Product.

The stockhouses are immense buildings, constructed of concrete, and have storage capacity for many thousands of barrels. After the material comes from the finishing mill, either the gyratory or tube mill, it is carried by elevators into conveyors and distributed through the stockhouse into hopper-shaped bins, from which the material is run into bags and barrels for shipment to the markets of the country.

This, briefly, is the story of the manufacture of American Portland cement in a modern plant, but in its entirety is only a detail in the producing the standard material, upon the results of which are dependent the reputations, fortunes and lives of individuals.

No reference is made to the eternal vigilance of the chemist and manufacturer in the testing of the finished cement before it is sent to the market of consumption; to the disappointments and obstacles overcome in first arriving at the best results; to the delays occasioned by break-downs and further delays in non-arrival of important parts of working machinery; to the constant tests.

(Continued on Page 39.)

VULCANITE'S THREE MILLS.

Scrupulous Care is Taken in the Manufacture of Popular Brand of Cement.

PHILADELPHIA, Pa., December 15.—One of the most complete and modern of the Portland cement plants of the Lehigh Valley is that of the Vulcanite Portland Cement Co., at Vulcanite, Warren County, New Jersey. The plant is located on spurs of the Central railroad of New Jersey, and consists of 250 acres of land, with quarries containing an inexhaustible supply of argillaceous limestone or cement rock and three factories. The original mill 1, has five rotary kilns; mill 2 has six, and mill 3 has ten rotary kilns. These factories are all within short distance of each other, but each is complete and independent of the others and has its own quarry outfits, cable tramways and power installation.

This is a most advantageous arrangement, for should one mill be put out of commission by fire, or other causes, the others, being entirely independent, can continue, thus insuring a certain supply of cement.

No better proof of the success of Vulcanite Portland cement is needed than the necessity for building of Mill 3, which, in capacity of production, equals the combined outputs of Mills 1 and 2, and which, added to them, gives a grand total production of 1,400,000 barrels of finished cement a year.

Vulcanite Portland cement differs from other Portland cements in the care with which it is prepared, the high development of the details of manufacture and the systematic course of selection and inspection which it undergoes at every step of the process. The result is a technically perfect cement and strict uniformity of product. The processes are mechanical, insuring at once greater efficiency, larger output and more economical production.

The cement rock leaves the quarries in skips on rope tramways, and arriving in front of the stone house is dumped into cars of three tons capacity. As the cars are filled, pieces of rock are taken from each car as a laboratory sample. The cars are then run into the stone house and emptied into marked bins.

When a bin is full, an analysis is made which shows the average composition of its contents. As the cement rock is frequently lacking in lime it is necessary to add limestone. This is brought by rail and also emptied into bins in the stone house, samples being taken from each car as it arrives, and subjected to laboratory examination. As each bin is filled with limestone an analysis is made to ascertain the average composition of the contents of the bin, as in the case of the cement rock.

An analysis having determined the proper proportions, the cement rock and limestone are mixed together by weight and charged into a crusher, and by it reduced furthermore.

This analyzing and weighing is done to insure the mixture being uniform in composition, so that when it reaches the kilns it can be fused without varying the temperature and thus result in a hard, evenly burned clinker.

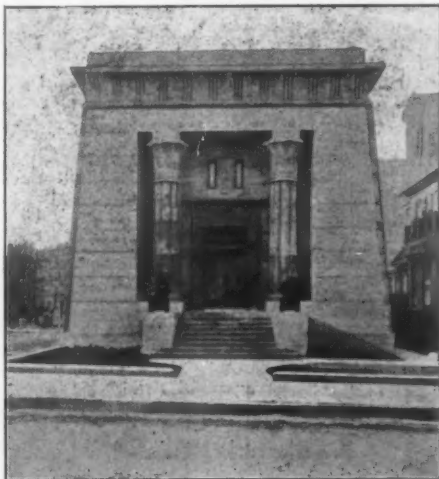
From the crushers the mixed rock goes to screens, from the screens to driers, which deprive it of all moisture, from the driers to "raw" mills which grind it finely and intimately mingle the cement rock and limestone. From the "raw" mills it goes to the kilns. From the kilns, the cement clinker is conveyed to large tank-like coolers where it is cooled by blasts of cold air.

From the coolers, the clinker is conveyed to the clinker storage house, where it is partially hydrated and then is taken to the finishing mills, which pulverizes it into Portland cement. After being ground to the required fineness it is conveyed to the storehouse where it is cooled and fully hydrated.

After it is thoroughly "cured" it goes to the packing department, where it is weighed into bags and barrels, and is ready for shipment.

The laboratory is in charge of a chemist of long experience, assisted by technical graduates. The regular chemical work is the examination of rock drillings, analyses of the raw rock in the stone store house, the limestone, which is added to the cement rock, the raw mixture, burned clinker, daily grindings of the finished cement, average bin samplings and various samples of coal.

The methods used are gravimetric and volumetric forms of analysis, recognized as standard in all laboratories.



FRATERNITY HOUSE AT YALE MADE ENTIRELY OF VULCANITE CEMENT.

Coal samples are analyzed, for moisture and volatile combustible matter, fixed carbon, ash and sulphur, because many so-called gas coals are low in volatile hydrocarbons and not adapted to cement burning.

It being desirable to obtain a coal for burning in the kiln the ash from which will not cause any material change in the composition of the cement, the amount of ash is not only determined, but likewise the component parts of the ash itself are ascertained.

The cement from each bin in the store-house, after it is filled and each carload ready for shipment, is separately treated for set, fineness, tensile strain, and various pat tests, comprising air, water, boiling water, steam, kiln and calcium chloride immersion. The specific gravity of the cement is determined daily.

Tensile tests are made, and briquettes, of every filling of each bin, are made and kept for periods ranging from seven days to ten years. These records not only keep the company in touch with the product of the immediate present, but have proven instructive and of great interest as to the product of former years.

A small amount of every day's grinding of cement is bottled, properly labeled and retained for future reference; so that in the event of any controversy arising at any time over a certain shipment, the company not only has its own records to consult, but can submit a portion of the cement in question for analysis.

"Vulcanite" cement is ground 95 per cent fine on the No. 100 mesh sieve and 80 per cent of the whole will pass through the No. 200 sieve.

The great capacity of the storehouses at the plant (nearly 500,000 barrels) obviates the necessity for shipping what is known as "green or unhydrated cement"—no matter how great the demand.

The officers of the company are John B. Lober, president, who is also serving his third term as

president of the Association of American Portland Cement Manufacturers; George W. Elkins, vice president; W. D. Lober, secretary and treasurer; and the main office of the company is in the Land Title Building, Philadelphia. The main sales office is in the Flat Iron Building, Broadway and Twenty-third Street, New York, in charge of Albert Moyer.

Unending attention and care are given to the packing and shipping of "Vulcanite" Portland cement, in order that it may arrive at its destination in as good condition as when it left the factory.

No package of any kind is placed on the cars for shipment until it has been thoroughly inspected and accurately weighed by the competent foreman of the department, and to this scrupulous exactness is due, in a great measure, the success of Vulcanite Portland cement which has been manufactured since 1895, and its retention of its present commanding position among Portland cements.

United States Cement Company.

BEDFORD, IND., December 14.—The plant of the United States Cement Co., manufacturers of the well known "Bedford" Portland cement, is located on the B. O. & S. W. Railway, between Bedford and Rivervale, at a station called Lehman, Ind.

The limestone from which this cement is manufactured is quarried at this point and is high in calcium and well adapted to the manufacture of a high grade Portland cement. The company owns three hundred acres of limestone property, and it has been estimated that there is enough limestone to run the plant for 100 years. The shale is secured from the company's own quarry located at Brownstown, about 25 miles distant. They use West Virginia coal. This plant was built three years ago and is modern, being equipped with the latest machinery and labor saving devices.

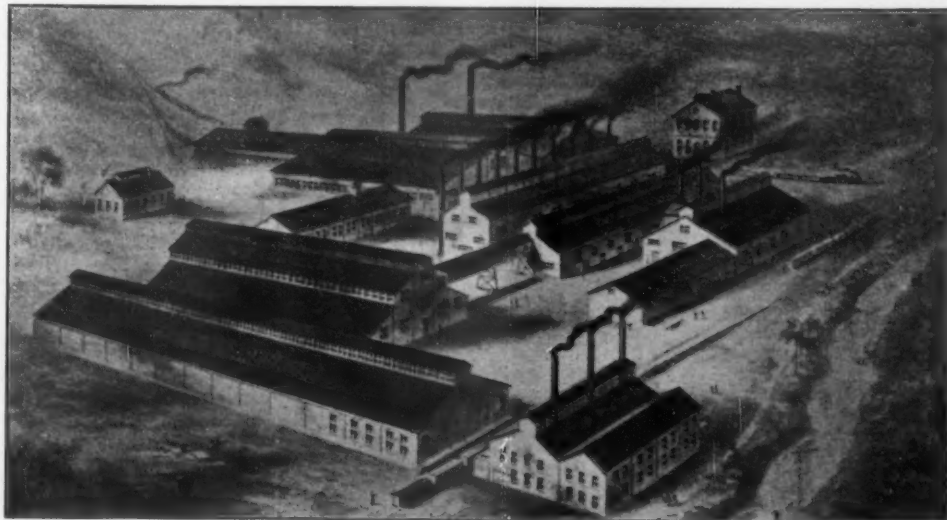
The quarry from which the limestone is secured is situated in close proximity to the mill, and a dinky engine and steel cars, holding six yards of stone each are used to convey the limestone to the two No. 5 Austin crushers, from whence it is conveyed to the two Allis-Chalmers tube mills, then to the twelve Griffin mills, manufactured by the Bradley Pulverizer Co., of Boston.

The shale is ground up in a crusher and conveyed to the Williams mill, thence to the dryer made by W. F. Mosser & Son, of Allentown, Pa., and is now ready to be sent to the kiln.

The coal is received in immense cars and unloaded at the bins and is ground by four Griffin mills. It is now carried to the dryer, manufactured by F. Cummer Sons Co., of Cleveland, O., and from there carried over by air pressure to ten steel bins located in the kiln room.

The power for this entire plant is furnished by five Williams and two Exeter engines, aggregating 3,000 h. p. Sixty individual motors, ranging from ten to one hundred h. p. are distributed about the mill. Each of the Griffin mills is operated by a separate motor of 30 h. p.

There are ten rotary kilns of the Allis-Chalmers make, having a total capacity of about 2,000 barrels a day. The clinker is carried by a steel



PLANT OF UNITED STATES CEMENT CO., LEHMAN, NEAR BEDFORD, IND.

bucket conveyor into a tower and from thence it is dumped into a storage bin where it remains for about three days after which time it is conveyed to the sixteen Grifflins, ground to an impalpable powder, and thence to the warehouse. It is now ready for packing into bags and for shipment to the market.

The company maintains a chemical laboratory and employs a chief chemist and an assistant, who not only make tests of all raw material, but make hourly tests of the finished product, and daily tests for tensile strength, fineness, and setting qualities. Every carload which leaves the plant is submitted to tests in line with the requirements of the Standard specifications adopted by the American Society of Engineers.

This company has made quite a record during the few years of its existence and the quality of its product has given satisfaction, and has stood severe tests under all exacting conditions.

The water supply is furnished by a running stream which traverses the property. The company owns the right of way on this stream which is called Leatherwood Creek, which gives ample supply of water at all times. This company has exceptional shipping facilities, and has a switch engine of their own. They own about 310 acres of adjoining property which they have divided into 200 lots and have commenced the erection of tenement houses for the housing of their employees.

One of the severest tests to which any Portland cement has ever been subjected was at the time when 30,000 people congregated on the floor of the Armory Building, Louisville, Ky., which was designed to hold but 16,000 people. Six thousand barrels of Bedford Portland cement were used in its construction, the bed being made of a cinder concrete. Caldwell & Drake, well known builders and contractors, of Louisville, use Bedford Portland cement almost exclusively on all their work. They were the contractors for the Armory building, and are at present using 150 cars in the construction of the State Capitol building at Little Rock, Ark. Ten thousand barrels of Bedford Portland cement were used last month in making public improvements in New Albany, Ind. The First Presbyterian church, of Owensboro, Ky., is built of concrete blocks made from this well known brand of Portland cement, as is also the pastor's home. These blocks are colored red, and the buildings have the appearance of red sandstone, and have attracted no end of favorable comment.

The sales office of the United States Cement Co., are located at 501-502 Commercial Club Building, Indianapolis, Ind. The officers of the company are: Elbert Walker Shirk, president; F. M. Talbot, secretary, and A. Lehman, treasurer and general manager. Mr. Lehman spends about one-half of his time at the plant and is thoroughly in touch with the situation from both ends.

Will Have Well Located Plant.

KANSAS CITY, Mo., December 15.—The Kansas City Portland Cement Co., with offices in the Dwight Building, are building a 1,500 barrel plant near Kansas City, Mo. The company is incorporated under the laws of New Jersey with an authorized capital stock of \$1,500,000.00. The officers of the company are: F. E. Wear, president; W. E. Murlin, vice president and general manager; W. A. Rule, treasurer, and A. L. Murphy, secretary. The only strange thing about this new company is the fact that this location was not gobbled up a long time ago, as it possesses natural advantages, which, since they have been discovered, would seem to indicate that other cement manufacturers in their rush for locations, had really gone out of their way to find a location, when right under their very eyes there is found all the materials necessary for the manufacture of a high grade Portland cement, within only a few miles of one of the largest and most thriving cities in the West.

As is well known and verified by the State Geologist, Kansas City is underlain with the best quality of limestone, shale and silex for the manufacture of Portland cement to be found anywhere in the United States. The property consists of 72 acres, a solid mountain of cement rock and shale 300 feet high, fronting one mile and a quarter on the Missouri River, and adjoining the tracks of the Santa Fe railroad, thus giving them the advantage of both water and railroad transportation to any part of the continent. It would seem, on the face of it that this company has an advantage over any other company as far as freight rates are concerned, as Kansas City is one of the largest terminals in the entire West.

The Rock Products' representative went out to the site of the plant, which is about three miles from Independence, Mo., and found an army of workmen busily engaged in erecting the immense buildings, some of which were already nearing completion. The plant can be said to be about 40 per cent complete at the present time, and they hope to be shipping cement not later than next May. The materials are so abundant and nature has so lavishly placed them that for 100 years at least, this plant could operate without making any very serious change in the face of the immense mountain of limestone and shale, which underlie each other in almost regular strata from the top to the bottom, or 300 feet in all.

The Freeborn Engineering Co. has charge of the construction of the plant, which is to be entirely of reinforced concrete. The buildings will be substantial and commodious, and while the plant is to be started with a 1,500 barrel daily capacity, it will be so arranged that it can readily be increased to double that amount.

Prof. R. C. Carpenter, of Cornell University, secured some samples of the materials and manufactured samples of Portland cement which have stood all the government tests. It is lighter in color than almost any other cement produced in the West at the present time. It would seem as if this company was especially favored as they not only have all the materials close at hand, but the site is peculiarly adapted for the purpose. The crusher and drying plants will be at a 200-foot elevation, and the kilns and storage bins will be at a 100-foot elevation. It will be seen by this arrangement that the laws of natural gravity will be available.

While this company will use oil secured from the Standard Oil Co.'s immense storage tanks close by, they could also use coal which can be secured at a small cost. Natural gas is also found in this locality, but oil has been selected as being the cheapest fuel of the three.

HOW CEMENT IS MADE.

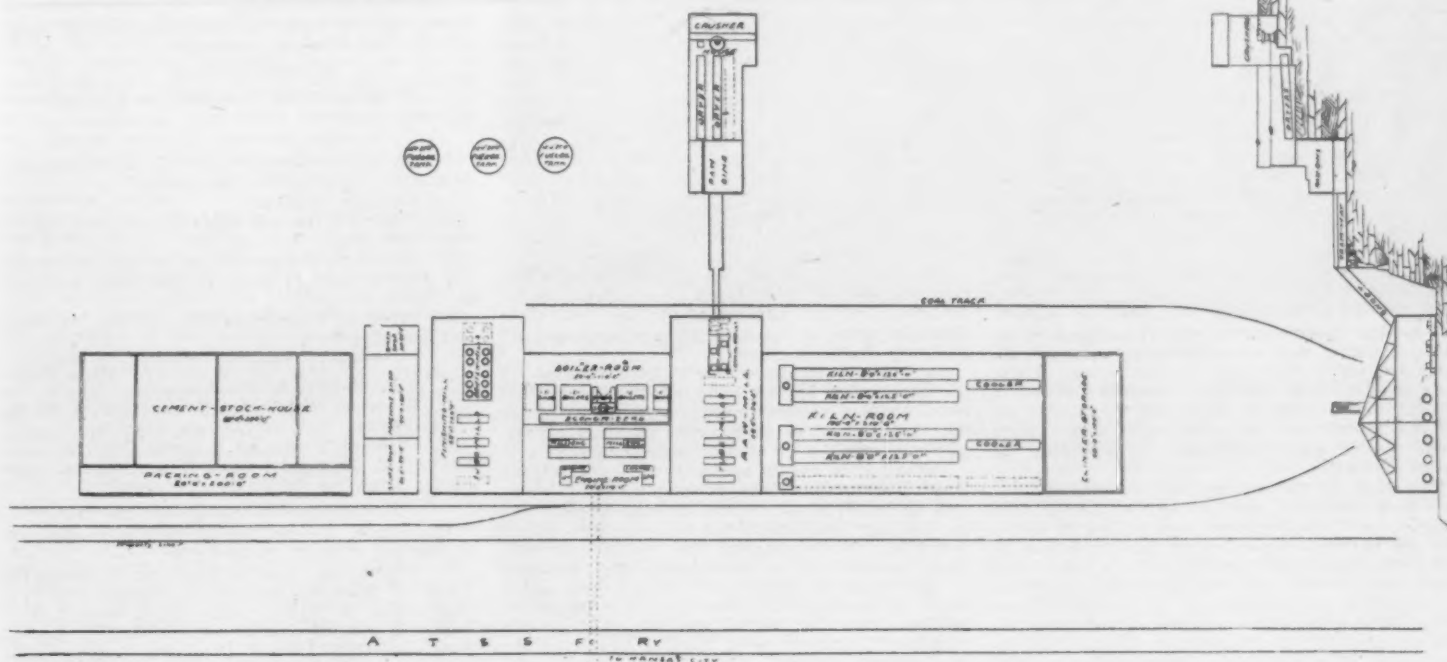
(Continued from Page 37.)

collation of results of experiments, co-operation of individuals and associations, which is unceasingly being carried on.

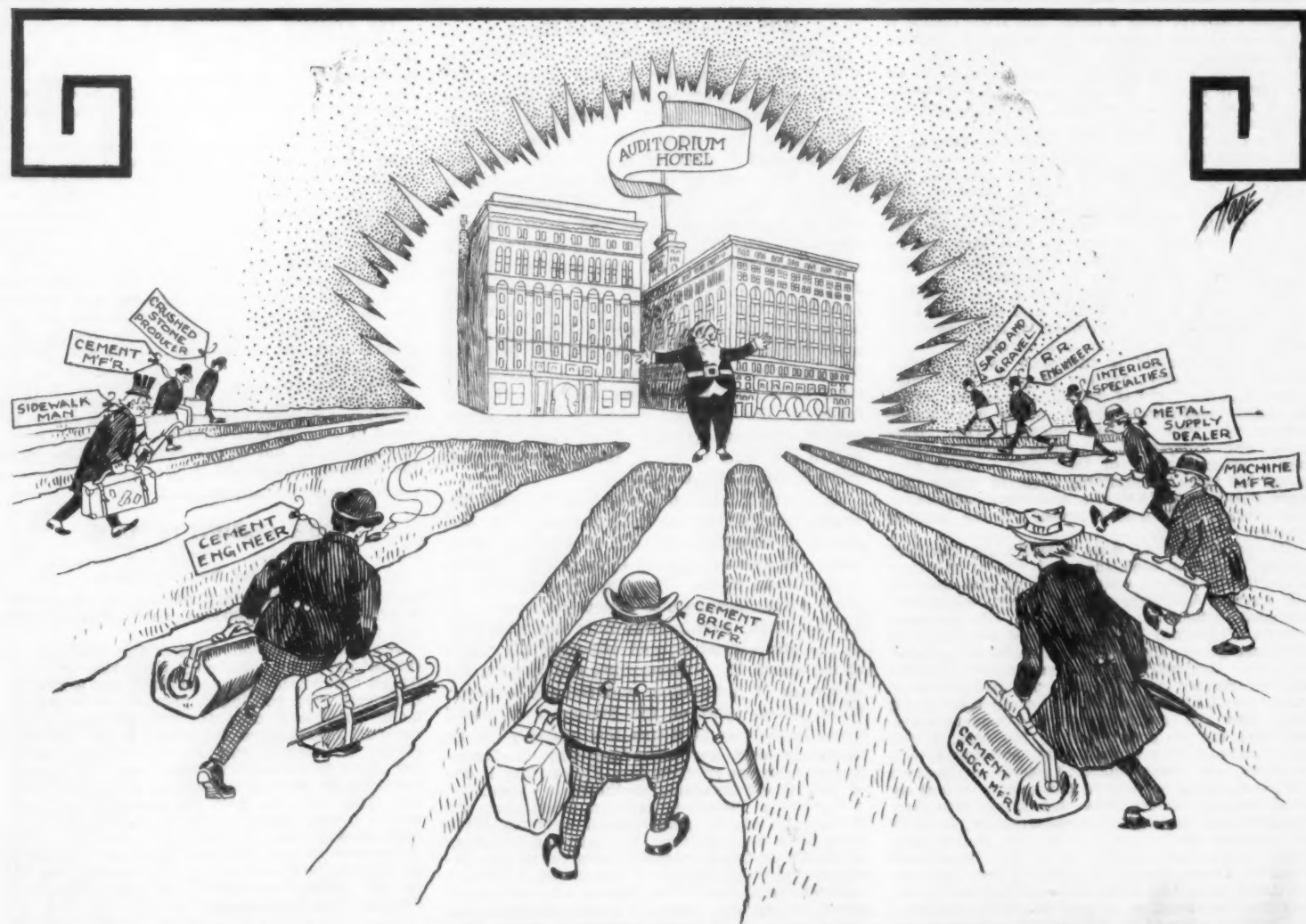
With the explanation given of this one detail of this all important commodity, the reader can readily see that when the manufacturer has arrived at the point of producing a standard Portland cement which will meet the requirements of the standard specifications for cement of the American Society for Testing Materials, it is not only easier but really cheaper to keep the cement up to standard, than to produce material of an inferior quality. Therefore, the user, the man who lays sidewalks, makes blocks or builds dams and reservoirs should treat the material with the respect it deserves by the mere earnestness of purpose in its manufacture, and not take the easiest way out of any sudden controversy by the selfish cry, "Blame it on the cement."

The New Castle Cement Co., New Castle, Pa., has recently purchased 301 acres of land along the Western Allegheny railroad in Butler County.

Fire recently destroyed the roof of the kiln house and boiler house of the Coplay plant of the Atlas Portland Cement Co.



PLAN FOR PLANT OF KANSAS CITY PORTLAND CEMENT CO.



ALL ROADS LEAD TO CHICAGO.

The Third Annual Convention of the National Association of Cement Users, which is to be held at Chicago, Ill., January 7-12 promises to be the greatest yet recorded in the history of the associated effort on the part of users of cement.

The headquarters of the convention will be at the Auditorium Hotel and the session will be held in the grand banquet hall, which in point of accommodation for such a purpose far outclasses anything that the association has known in the past, while the exhibit feature will be taken care of in the great Armory building of the 7th Illinois Regiment.

The Exhibitors will have accommodations equal to a World's Fair proposition, for permission has been received to operate gas and gasoline engines, and electric motive power will be supplied to all those requiring such accommodation to propel the machines which they have on exhibition. From the list of concerns who have retained space, it is evident that a splendid exhibition of cement using machinery will be presented, which feature alone is well worth the expense of attending the great convention.

The local cement and machine interests of Chicago have certainly done themselves proud with their liberality and earnest co-operation in assisting the national committee in all the details of the arrangements for handling such a large number of people who have expressed their intention of attending the Convention. A guarantee fund of \$3,000.00 in cash has been raised and placed in the hands of the convention authorities to strengthen their hand in contracting for the necessary expenditures for the accommodation of the visitors. While the regular membership fee is \$5.00 a year, it has been arranged that attendants at the convention have all the privileges of

regular members, except that of voting for officers and upon questions relating to the business management of the association, by the payment of a \$2.00 convention fee. All the railroads have granted a fare for the round trip which amounts to the fare one way plus one-third. It is necessary for members and attendants at the convention at the time of purchasing their one-way ticket from their local ticket agent to request a standard receipt. This standard receipt, when countersigned by the secretary of the association and endorsed by the joint representative of the railroads at the convention, will entitle the holder to two-thirds of the price of his return ticket. The hotels of the city of Chicago afford ample accommodation for any number of visitors, and these range in price to suit the purse of any and all who may decide to come.

An information bureau will be conducted by the association in the lobby of the Auditorium Hotel so that parties unacquainted with Chicago may be directed to such places as their engagements, necessities or election may suggest.

Though it is hardly necessary for us to repeat, Rock Products cordially extends a hearty invitation on behalf of the association management and the Chicago local committee to every man who is interested in the manufacture and sale of concrete commodities, or who is a user of cement in any way to attend the Chicago convention with the assurance that no such man can attend without receiving actual and tangible benefits which will amount to at least a hundred times the cost of such attendance in one year's active operations in the cement field.

Following we give the program as arranged by the Executive Committee, and it will be noted that the afternoon of each day of the con-

vention is left open for the attendance of members and guests at the exhibit hall:

MONDAY, JANUARY 7.

1. Formal opening of Exhibits in 7th Regiment Armory, 12 o'clock noon.

TUESDAY MORNING, JANUARY 8.

2. 10 A. M.—Formal opening of Convention (Banquet Hall, Auditorium Hotel.)
3. Business Session.
4. Paper on Cement Sidewalks—Albert Moyer, New York City.
5. Report of Committee on Streets, Sidewalks and Floors—Geo. L. Stanley, Chairman, Ashtabula, Ohio.
6. Paper on Proportions, Mixing, etc., for Mortars and Concrete.

TUESDAY EVENING, JANUARY 8.

7. 8 P. M.—President's Address.
8. Paper on Re-Inforced Concrete—Prof. W. K. Hatt, Purdue University, Lafayette, Ind.
9. Paper on Forms for Concrete Construction—Sanford E. Thompson, Cons. Engr., Newton Highlands, Mass.

WEDNESDAY MORNING, JANUARY 9.

10. 9-10 A. M.—Meeting of Section on Concrete Blocks and Cement Products.
11. Paper on Simple Tests for Determining Value of Materials for use in Mortar and Concrete—Wm. B. Fuller, Cons. Engr., New York.
12. Report of Committee on Testing Cement Products—E. S. Larned, Chairman, Boston, Mass.
13. Business Session:
 - (a) Report of Executive Committee.
 - (b) Place for Next Convention.
 - (c) Election of Officers.

WEDNESDAY EVENING, JANUARY 9.

14. Paper on Artistic Use of Concrete—A. O. Elzner, Archt., Cincinnati, Ohio.
15. Paper on Finish for Concrete Surfaces—H. H. Quimby, Engr., of Bridges, Philadelphia, Pa.
16. Paper on the Treatment of Concrete Surfaces—Linn White, Chf., Engr. South Park System, Chicago.
17. Report of Committee on Art and Architecture—Chas. D. Watson, Chairman, Toronto, Canada.

THURSDAY MORNING, JANUARY 10.

18. 9-10 A. M.—Meeting of Section on Streets, Sidewalks and Floors, and Re-inforced Concrete.
19. 10 A. M.—Paper on Concrete Blocks—H. H. Rice, Denver, Colo.
20. Report of Committee on Concrete Blocks and Cement Products—M. S. Daniels, Chairman, Suffern, N. Y.
21. Discussion by Spencer B. Newberry, Sandusky, Ohio.
22. Report of Committee on Machinery for Cement Users—J. F. Angell, Chairman, Columbus, Ohio.
23. Paper on Concrete Block Architecture.

THURSDAY EVENING, JANUARY 10.

23. 8 P. M.—This evening will be devoted to sociability; members are to be given an opportunity to become better acquainted. Details will be announced later.

FRIDAY MORNING, JANUARY 11.

24. 9-10 A. M.—Meeting of Section on Testing Cements and Cement Products; Concrete Blocks.
25. 10 A. M.—Waterproofing:
 - (a) H. Weiderhold, Philadelphia, Pa.
 - (b) Edward DeKnight, New York City.
 - (c) J. W. Fish, Sandusky, Ohio.
 - (d) G. G. Fry, Indianapolis, Ind.
 - (e) S. J. Hinswanger, Chicago, Ill.
26. Report of Committee on Fireproofing and Insurance—E. T. Cairn, Chairman, New York City.

FRIDAY EVENING, JANUARY 11.

27. Business Session.
28. Report of Committee on Laws and Ordinances—H. C. Hemley, Chairman, St. Louis, Mo.
29. Paper on ———
30. Paper on ———
31. Adjournment.

SATURDAY MORNING, JANUARY 12.

32. 12 Noon—Closing Exhibits.

The Northwest Convention.

The Third Annual Convention of the Northwestern Cement Products Association is announced to be held at St. Paul, Minn., on January 16, 17, 18, in the New Auditorium which provides plenty of room for exhibits and for meetings.

The City of St. Paul and her Commercial Club have done their part. The record of two successful conventions, largely made up of parties located in the great and growing Northwest, is the best assurance that this third convention will be largely attended on account of the ever growing and widening interest and influence of concrete in the permanent construction of the Northwestern country.

The efficient transportation committee has secured a special concession from the Western Passenger Association for a fare and a third from all points in Iowa, Minnesota, Wisconsin, Montana, North and South Dakota, Illinois and Nebraska. The hotels of St. Paul will also give special rates during the convention. It will be necessary for those purchasing tickets to St. Paul to ask for a certificate receipt, which must be presented to the secretary of the association at the convention hall to be signed, and a certificate will be issued which will entitle the bearer to return to his original destination at one-third of the regular fare. Tickets are good for three days prior to January 16, 17 and 18, and three days after.

What Our Pictures Show.

Observe that the illustrations we present in the concrete department are selected with a view to show to cement users, engineers and architects, and to the world at large some of the many uses to which concrete construction has been applied with successful practice. Each and every one of the pictures shown are made from actual photographs, not retouched or improved in any way, so that a fair idea of the use of concrete in practice may be set forth.

The beautiful residence of concrete building blocks is only a type of many thousands of sim-

ilar residences located in almost every State. The reinforced concrete construction of the great department store is a good sample of such work to be found in all our great cities, and at the same time it shows that our home city of Louisville is right in the front rank in the introduction of concrete construction.

The handsome lighthouse in Lake Michigan speaks for itself upon our page, even as it does to the tempest tossed mariner who welcomes its steady and unfailing light which is anchored to the most impregnable material that man has ever used in construction.

The concrete approach to the great Thebes Bridge which spans the Father of Waters, shows that the engineers in charge of the great railroad construction enterprises of our land, have come to a realization of the indispensable lasting qualities,

every part of the building, from the cellar floor to the capital of the most elegantly carved column which supports the magnificent interior. Its usefulness is not without end, nor is the end of its application yet thoroughly understood.

The elegant church built of concrete blocks more economic than anything of similar attractiveness in the way of a building material has ever been wrested from the bosom of nature as found in the rock quarry. Here the sand and gravel, which are scattered so indiscriminately upon the earth's surface, are combined with this wonderful material, cement, and molded into imperishable building stone. Thus is sand, which had been the type in all times of unreliability with reference to buildings and their safety, magically changed until it is capable of being made as the chief stone of the corner.



LIGHTHOUSE IN RACINE HARBOR, WIS., BUILT BY THE GREAT LAKES DREDGE AND DOCK CO., CHICAGO, USING 2600 BARRELS OF UNIVERSAL PORTLAND CEMENT.

as well as intrinsic economies to be found by the use of cement in concrete abutments, trestles, culverts, retaining walls and tunnels, for with this imperishable material, the work once completed stands forever.

The exquisite turn in the stairway shown in another illustration, exhibits the unsurpassed qualifications of concrete when manipulated under the direction and by the skill of accomplished engineers, for the completion of the finished furnishings of even the most tasteful interior, and it reflects back not only the beauty of design which first appeals to the eye, but carries the strength and reliability here the same as when it is used in making the footings and the unseen foundation piers. No such universally adaptable material has ever been presented for the consideration of the practical builder, for its usefulness is applicable to

Another illustration shows the interior of a stable, where concrete is employed for making a safe and comfortable place for the domestic animals which contribute the comfort and convenience of the human family; safe because the possibility of fire is reduced to the minimum, or in fact made absolutely impossible; made vermin-proof because the character of the material is such as to exclude the possibility of insects of any description making places to propagate. This application is destined to work a miraculous change in the affairs of farming communities, for when swine are kept in concrete enclosures, with properly drained concrete floors and concrete feeding troughs, the many dangers which assail this great food product by the ravages of disease are largely eliminated, for nearly all the diseases of such animals have their inception in bacilli which are brought into being

by the accumulation of filth, the decomposition of vegetable matter, and the contagion contained in the clay and soil of the enclosure itself. We are coming to the time when the barn-yard will be furnished with a concrete floor, and the poultry man is sure to find a remedy by the use of concrete for many of the ills which the feathered tribe is heir to. This establishes the hygienic element in concrete building, not only for the use of man but for every denomination of domestic animals which are indispensable to the support of life and the progress of civilization.

The handsome pumping station of concrete blocks with the great chimney from the same material, shows what has been done and is being done to-day in very many places by the use of concrete blocks to economically furnish municipalities with such public works as would be beyond their possible appropriation, if any other material for this construction had to be considered.

The school house, the railroad depot platform, the silo, the viaduct, and the mausoleum, only show further details which suggest still others where concrete, the king of building materials, is being applied for the upbuilding and uplifting and final completion of modern civilization. For every age is measured by the character, quantity and measure of its building. These constitute the record which is passed on to succeeding generations, and the mark and character now being developed, clearly indicate that this great keystone age of civilization, will pass on to future ages as its greatest accomplishment, the introduction and practical application of concrete construction in all its various forms, and in all its many phases of usefulness.

Prize Contests.

December 1, Rock Products offered \$200.00 in prizes to manufacturers of concrete building block and brick, and the engineers and architects engaged in concrete construction, for the best photograph of a completed building, constructed entirely of concrete as far as the walls, footings and structural members are concerned. The only stipulation for entering into this contest was that the party making the entry should be a subscriber to the concrete edition of Rock Products, paid one year in advance, and that he furnish a good photograph of the building entered in the contest, together with a brief written description, giving the principal points of the materials contained and the manner and method of its construction, and to state where and of what materials the concrete was manufactured and by what process they were made.

We have decided that a jury consisting of one architect, and one contractor who is engaged in concrete construction shall be selected by Rock Products as the judges to make the awards as follows:

First prize, \$50.00; second prize, \$30.00; third prize, \$20.00; five prizes of \$10.00 each; five prizes of \$5.00 each, and twenty-five prizes of \$1.00 each.

The two judges which we shall appoint will themselves select the third party to sit with them and cast the deciding vote in case of a disagreement, and the prizes will be awarded over the written findings of such court.

We expected and first announced that this contest would terminate with January 1, and a very large number of entries have been recorded, but at this time we find it impossible to close the contest for the reason that a great many entries have been made which are incomplete with regard to the details, which have to be returned for correction, and many have complained that the time was too short in which to secure the good photograph required in certain localities, where weather



PUBLIC SCHOOL AT FAUNTON, MINN. NORBY & JONAS, CONTRACTORS, MINNEOTA, MINN. ATLAS PORTLAND CEMENT USED.

conditions prevent outdoor photography for weeks at a stretch. In view of all this, and in justice to those who are really entitled to have their entries properly considered, we have placed the date for the closing of the contest, at February 1, 1907, and all of the interested parties who read this notice will govern themselves accordingly.



CONCRETE BOX STALLS, BABYLON, I. I. ATLAS CEMENT USED.

"Stone Making."

The literature issued by the machinery concerns catering to the concrete stone manufacturers, is well worthy of perusal from an educational standpoint. The well known Pettyjohn Co., Terre Haute, Ind., have recently published a fine catalogue entitled "Stone Making" which describes all the machines which they build and incidentally in a terse and straightforward manner hands out information which will bear repetition here, although most of the readers of Rock Products will recall fuller and more complete articles covering each of the topics, but for conciseness and the wide range of information that it contains will undoubtedly be appreciated:

"The man who is deciding to venture in the concrete block business will first of all investigate several things, all of which tend to convince him either that it is a paying or losing business, and on his findings he will either enter or stay out of it. His first question naturally is, 'Does it pay?' If he finds enough demand for blocks, he can enter the business, buy a block machine, and make the product. Before he places his order, however, it is well for him to look into the merits of the various machines. The question of material is important, for suitable sand, gravel or crushed stone is not found in every locality. In some places, there is a splendid, clean, sharp sand and gravel found in large deposits. In others, there are stone crushers, the screenings from which may be used to great advantage. Again, it may be necessary to install a small crushing plant to obtain the desired product. Now comes the question of cement. Any good Portland cement will be found satisfactory, and the cost of any of them is practically the same, although some may cost more than others on account of the freight charges being higher according to the distance the factory is located from the block plant.

"Now, let us see what really constitutes real, honest concrete. It is a mass of aggregates, grad-

ed in size from the largest pieces to the smallest, with just enough of the smaller and smallest ones to completely fill the voids between the larger ones, and each and every particle completely coated with cement properly tempered with water. If this is done you have true concrete, and if it is not done, your product is not perfect, and your customer will not be satisfied. Look well to the grading of your materials.

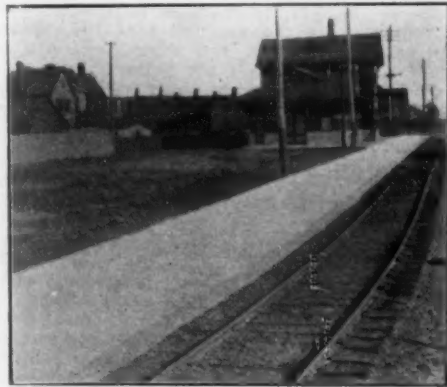
"Walls are sometimes damp, and when the cause is ascertained, it will be learned that while there was cement enough, sand enough and possibly mixing, tamping and curing enough, the grading of the aggregates was neglected, and the result is that the blocks are of a sponge-like nature, capillary attraction assisting in making the walls wet. All materials should be carefully graded so there will be no voids in the finished block. The question is often asked, 'will concrete stand fire?' Certainly it will. It is used for fireproofing and has been found better than any other material for that important purpose. Who ever heard of a concrete structure burning down? You might as well expect a cement sidewalk to catch on fire.

"Now to the main question. Does the concrete block business pay? Under ordinary conditions, yes. Under adverse conditions, no. Neither will any other business pay unless the conditions are right for the producer to make a profit."

Meeting With Success.

TOPEKA, KAS., December 3.—E. F. Fuller was recently visited by a representative of Rock Products, who found that he was one of the most extensive manufacturers of concrete building blocks in the country. He began his operations in April, 1906, at first investing only about \$1,000.00 in machinery, but soon began the manufacture of such a quality of blocks that they promptly passed the inspection of the fire marshal and the engineer in charge of the United States buildings, as well as the construction engineers of the Santa Fe Railway, and orders from these sources, won by the merits of the stone, soon had him swamped with orders. The original factory which was conducted in a basement 22x120 feet, was found to be insufficient in size in less than sixty days, and by the time the establishment was three months old the erection of a great plant 100x130 feet in size upon a plot of ground located right between sidings of the Santa Fe and Missouri Pacific railways was begun, and within thirty days with a full equipment of the latest machinery, the volume of the operations was extended until a railroad order for 40,000 blocks was not considered out of the ordinary. Mr. Fuller is now making arrangements to increase the capacity of his plant and extend his operations as a manufacturer and construction contractor to a size commensurate with the possibilities which are right before him. He says there is practically no limit to the amount of good concrete building material that can be sold.

The American Hydraulic Stone Co., Denver, Col., has issued an eighty page catalogue which contains a large amount of valuable information conveniently arranged with a number of artistic illustrations which is calculated to promote the best interests of the entire concrete industry. The catalogue shows that a great deal of time in careful study and no inconsiderable amount of money have been expended in its preparation. It is for free distribution to all those who have any interests in concrete block. It will be furnished to those who send a request for it.



DEPOT PLATFORM OF P. C. & ST. L. R. R. AT HAMILTON, O., BUILT BY CINCINNATI GRANTOID CO.



VIADUCT OF REINFORCED CONCRETE, OKLAHOMA CITY, OKLA., 320 FEET LONG.

CONCRETE IN CLEVELAND.

Despite Protests From Steel Frame Contractors and Architects Industry Has Thrived.

RAPID STRIDES ARE MADE.

CLEVELAND, OHIO, December 16.—Notwithstanding the earnest and constant protests on the part of some architects and contractors in steel construction, concrete building is forging to the front and is to-day one of the great industrial enterprises of Cleveland. With the exception, perhaps of the automobile industry, no other industry has taken more rapid strides than concrete building, and it encompasses as large an invested capital as any other in the building line, notwithstanding the strenuous opposition it has met from the old advocates of former methods of construction.

Concrete construction in Cleveland and vicinity is of quite recent date, but no other industry has grown so rapidly, made such marked, successful progress, as has this style of building, and the manufacture of concrete blocks and brick.

The first building of reinforced concrete construction erected in this city, was the citadel, in 1902, at the corner of Erie and Eagle Streets, for the Salvation Army, at a cost of \$95,000.00. It is a five-story and basement structure, 50x133 feet in size, fire-proof, the Hennebique system of armored concrete being used in constructing the beams, columns, floors and stairs. Frederick Baird, 218 American Trust Building, was the architect, and made the following report of a test made, which gives a clear idea of the requirements, and how absolute safety was insured. Mr. Baird made the report to L. J. Mensch, engineer, of Chicago:

"DEAR SIR: Regarding the test made at the Salvation Army building, December 16, 1902, I am pleased to give you the following data. The floor beams tested were 8 x 16 in., 7 ft. o. c. c., with clear span of 23 ft. 6 in. One end of the same connects to a column, and the other to a girder 8 x 16 in. near the center of the same. The girders, floors, columns, footings, galleries and stairs were all constructed in armored concrete, to sustain a load of 125 pounds per square foot floor loads. In the test, the above floor space over the girder 7 x 23 ft. was loaded gradually to 600 pounds per sq. ft., which was approximately 100,000 pounds on the beam. The greatest deflection was about $\frac{3}{8}$ in., and the final set was $\frac{1}{4}$ in. The beams and floors showed no signs of cracks or other defects, and the whole test was eminently satisfactory. The construction throughout and the material used were of the best quality, and promise to be as durable as anything yet obtainable or known to science—and also caused us a saving of 23 per cent over the cost in steel framing with tile floors."



APARTMENT HOUSE, CLEVELAND, BUILT BY CLEVELAND CONCRETE BUILDING BLOCK CO.

One of the distinguishing features of the building is the self-supporting concrete stairs. There are one hundred and seventy-five rooms in the building. Most of the first and second floors are occupied by the auditorium, school and class rooms, and the executive offices. The three upper floors contain reading, smoking and correspondence rooms, with 130 bedrooms, and is in fact a hotel. The building has been put to a severe test and stands to-day, as when completed.

Up to the year 1903-4 the city of Cleveland had not kept pace with the world in the use of reinforced concrete construction for building operations. The citadel was the only building up to this time designed strictly in reinforced concrete with columns, girders and beams of this material. Other work consisting of slab, floor construction had been used in some buildings, but it was limited in work of this nature. The extreme limitations imposed on re-inforced concrete construction by the Cleveland Building Code, made it commercially and structurally impractical for the investor or contractor to use the system for anything else than ordinary floors or short spans for steel or masonry building. It was principally due to the efforts of H. N. Hooper, C. E., who came from Cincinnati to Cleveland in 1904, to establish the Re-inforced Concrete Construction Co., that the building code of the city was revised in part, to provide more practical restrictions and the means secured for better inspection, consonant with the best construction.

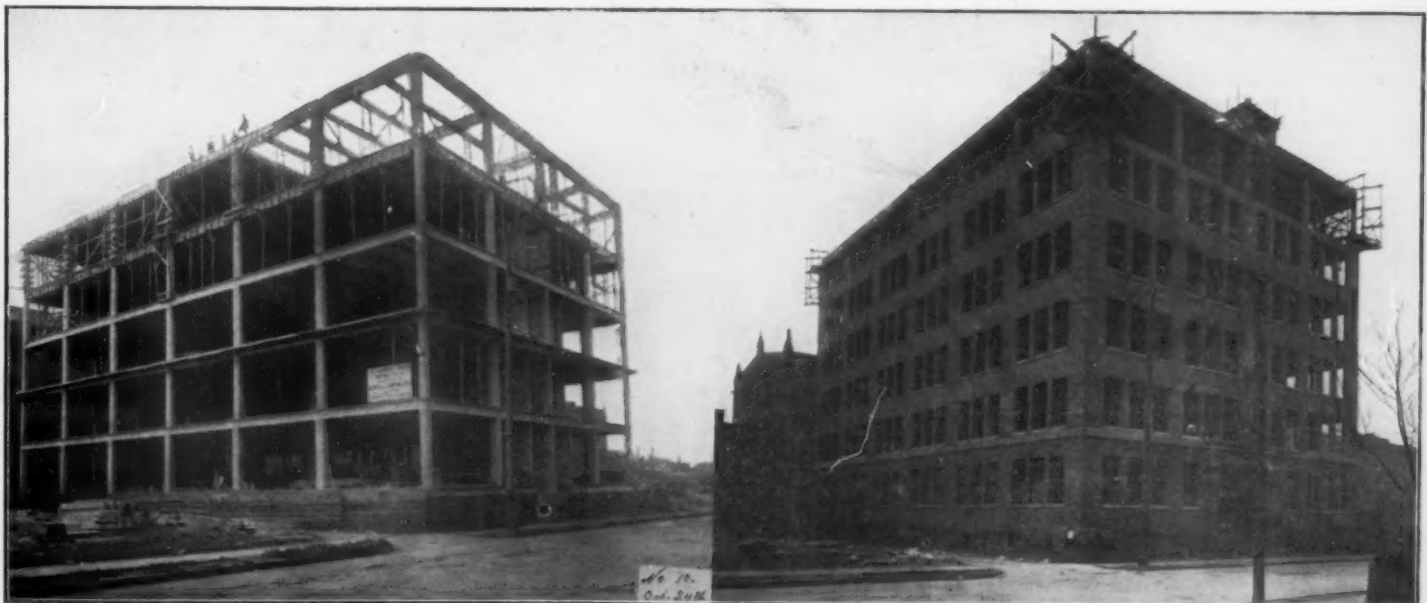
Mr. Hooper is widely known as a reinforced concrete engineer of large experience, and more especially distinguished as a designer of skyscrapers, in the construction of which the sixteen-story Ingalls building, at Cincinnati, erected in 1902, was the first example. Two others at Seattle, Wash., are about completed, and another at Cincinnati is designed to be carried up to its full height of fifteen stories at a later date.

Coincident with the revision of the Cleveland Code, reinforced concrete construction rapidly advanced in favor and a large increase in the number, size and scope of buildings of this construction took place, and to-day there is hardly a commercial building or institution in which it is not considered.

The Reinforced Concrete Construction Co. was incorporated in 1904. Its first year's efforts were devoted principally to breaking down the prejudices against concrete; in promulgating the possibilities of its uses; in raising the standard of construction, and in securing more practical building laws, which would permit its use and extend its application to six-story buildings, in place of the existing limitation to four stories. The result has been very marked, and this company has completed, and has in course of completion, several large plants in the city and in the neighboring cities. A few examples will give an idea of its work and extent of its operations. A four-story hotel, erected in 1904, was the first strictly concrete structure erected since the citadel of the Salvation Army. It was constructed with blast furnace slag as an aggregate. The six-story Perry-Payne Power Building is a most creditable example of the possibilities of this construction for factory purposes and of their work. It is one of five that are to complete the plant. The six-story factory for the B. F. Goodrich Rubber Co., at Akron, is another example of this company's work, as is also the Cleveland Transfer Station, 150 by 20 ft., also designed for six stories. In the building the stall partitions and runways are of concrete and are planned as a model for transfer uses. They are erecting the Union National Bank and the plant of the American Vulcanized Fiber Co., at Wilmington, also extensive retaining wall work at Boomer, W. Va., and have many other contracts throughout the country.

The Reinforced Concrete Construction Co. are general contractors for all of their work and their field of operations extend outside of Cleveland in every direction. They have executed a very large number of contracts, and have earned the reputation of giving the highest standard of workmanship that can be attained.

The Osborn Engineering Co. is one of the leading, if not the leading, company in Cleveland, doing reinforced concrete work. They claim to be doing more work in this line at the present time than any other concern. Their engineers were first to make a thorough study of such construction, and several important buildings and bridges have been designed by them. They have also acted as consulting engineers for the various architects in the design of reinforced concrete work. The Y-bridge at Zanesville was at the time of its construction, the most important concrete steel arch bridge in the country and was built under the supervision of the Osborn Co. Since then they have designed a number of smaller bridges in various parts of the country and are now preparing designs for a very large bridge at Toledo, Ohio, over the Maumee river, at Cherry Street. This bridge will cost about \$750,000.00. The approach span will be of reinforced concrete arches, and it will be one of the most important bridges of this character in the country.



POWER BUILDING, PERRY-PAYNE CO., CLEVELAND. BEFORE CURTAIN WALLS WERE BUILT AND AFTER, BUILT BY REINFORCED CONCRETE CONSTRUCTION CO.



RESIDENCE BUILT BY CLEVELAND CONCRETE BUILDING BLOCK CO.

In the building line the company is now finishing a warehouse for the George Worthington Co., of this city, which will be a six-story reinforced concrete building, 100 feet square, constructed of reinforced concrete frame and floors, and brick walls and a large eight-story warehouse, of similar construction, for the B. F. Goodrich Co., of Akron, Ohio.

The company is also constructing a concrete wharf nearly 1,000 feet in length for the Cleveland Furnace Co., on the Cuyahoga river.

The Carey Construction Co. were among the pioneers in reinforced concrete construction, and they have erected a number of structures in Cleveland and elsewhere. Among the more important buildings constructed by this company during 1906, were a fire proof, six-story storage warehouse, with approximately 7,000 feet of space to each floor, for the Fire Proof Storage Co. An office and store, six-story building, with space of 8,000 feet to floor, for Walsh & McGuire. A church at the suburban town of South Lorain, for the Rev. Joseph Zabo, entirely of concrete, with finished concrete walls, 60 by 120 ft., with tower. The foundry and machine shops at Indianapolis, Ind., owned by Langenkamp Bros. & Wheeler. The machine shop is three stories high and has an arched concrete roof. The reinforced concrete trestle and coal bunkers, 400 feet in length, for the National Carbon Co., of Cleveland. A building for the American Gypsum Co., at Port Clinton, Ohio, 80 by 260 ft., 70 feet high. This entire building with all the bins, runways and chutes are concrete; in fact, everything in and about the building is of concrete. These buildings are all of the Carey system of reinforced construction. They use round rods, with the shear members fastened integral to the tension and compression members. During the past three years the company has executed approximately 150 contracts, covering culverts, bridges, docks, churches, school houses, apartment houses, business blocks, warehouses, foundry and machine shops, paper mills, engine and boiler houses, filtration plants, railway trestles, coal bunkers, etc., and have laid over 3,000,000 feet of sidewalk, driveways and basement floors. The company has just been awarded a contract for the designing and erection of a four-story parochial school on East Sixty-fifth Street, to be of reinforced concrete, with pressed brick exterior finish. The structure will cost \$85,000.00.

Concrete Building Blocks.

The pioneers in the manufacture of concrete building blocks in Cleveland was the Cleveland Concrete Building Block Co., who started in business in 1902. The company manufactures hollow concrete building blocks on the H. S. Palmer system, the wall-blocks being of the standard length of 32 in., 9 in. high and 8, 10 and 12 in. in thickness. They also make window sills and caps, columns, capitals, cornices and ornaments of their own, or architects' special designs, for use in connection with the hollow blocks.

Crushing tests of the company's 10-inch blocks have shown a compression strength of 190 tons, or about 2,000 pounds per square inch of surface, which insures ample rigidity and load-carrying capacity. At the company's factory, corner of Harwood and Beyerle Streets, a large force is kept busy and the demand for their output is constantly increasing. A large number of residences have been wholly or partially constructed of their blocks.

The Cuyahoga Concrete Stone Co., corner of Bolton Avenue and the Nickel Plate Railroad, started in business in August, 1905. Their plant, it is claimed, is the largest in the United States, having a capacity of 6,000 blocks a day, equivalent to 135,000 brick. The company is operating

under the patents of the American Hydraulic Stone Co., of Denver, Col., and manufactures two-piece concrete blocks and ornamental stone.

Speaking of the desirability of these blocks, Mr. F. H. Anderson, secretary and treasurer of the company, said: "It has never come to our knowledge that an architect or engineer has found any fault with our system. The correct principles upon which it is based preclude criticism and have gained for it enduring success. The method is scientific, producing strong, dense, slightly blocks and brick."

Since starting in business here the company has had all the work it could handle, and the demand for blocks has been constantly increasing.

The company has constructed a number of buildings, conspicuous among which is one of the Cleveland High Schools, and a two-story store and office building, the latter entirely of blocks, the former faced with brick, to match the main building. They have just finished two of the largest single stones ever cast. They weigh 8,000 pounds each, are ornamental, and are to be used in the construction of a large garage for the Metropolitan Motor Car Co. While it is considerable of a problem to make such large stones, the company turned them out without the least difficulty.

The Collinwood Concrete Block Co., main office and plant at 7318 Lexington Avenue, is operating two plants, one at the above number and one at the corner of Ninety-third and St. Clair Avenue. They manufacture rock face, plain, and in fact, any design desired to imitate natural stone, including window caps, sills, etc. With a capacity of over 1,000 blocks a day, at both plants, their yards are stripped, and the manager said it was impossible to supply the demand. Their blocks have been used in the construction of a large number of residences in the city and suburban towns, and present a very attractive appearance. The company uses the Simplicity building block machines, manufactured by the Standard Sand and Machine Co.

William Kingsley, architect, has an office with the Cleveland Concrete Building Block Co. He has been a practicing architect for fifteen years and for the past three years located in this city. Previously his headquarters were in Chicago, where he designed many residences and apartment buildings. He designed and superintended the majority of buildings erected at Syracuse, Ind., for the Sandusky Portland Cement Co. The buildings are steel, monolithic concrete construc-



CONCRETE BLOCK RESIDENCE, BAY RIDGE, OHIO, DESIGNED BY W. M. KINGSLEY.

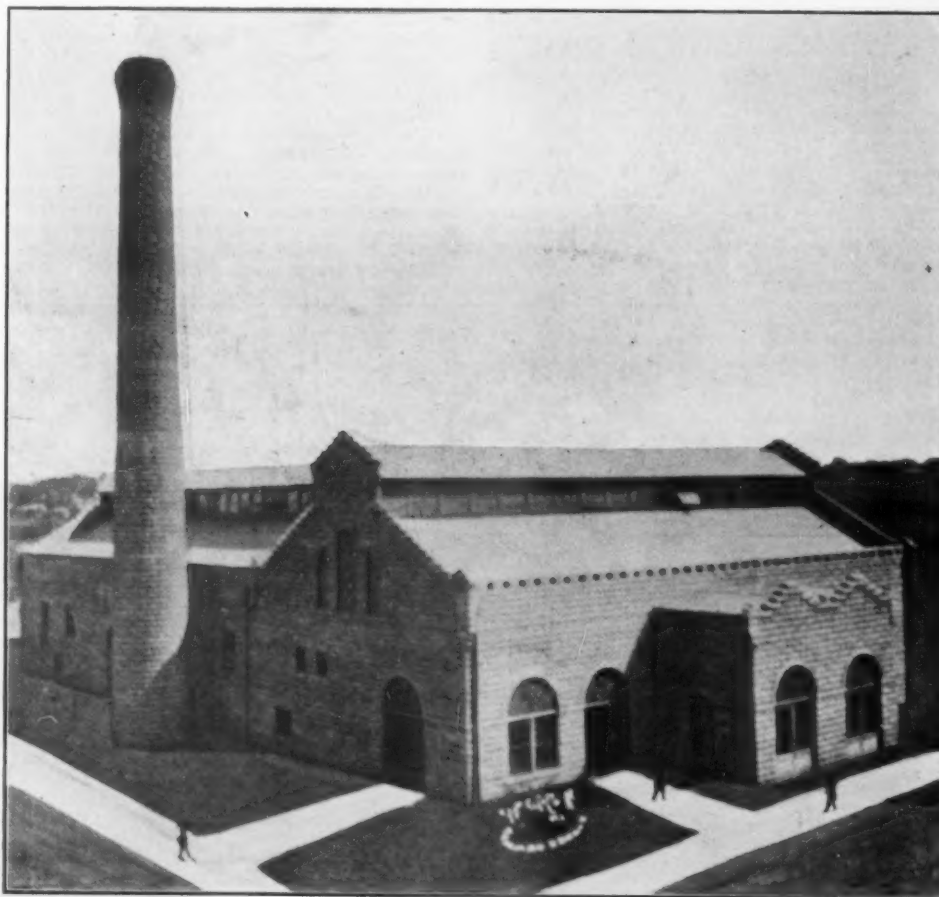
tion, brick and frame. Since coming to Cleveland he has confined himself to, and made a specialty of concrete construction, and has designed many residences and terraces constructed wholly and in part of hollow concrete building blocks.

He is the author of and has just published a book of designs for concrete block buildings, which is now on the market.

The Concrete Steel and Tile Construction Co., of Detroit, Mich., has been awarded the contract and has commenced the construction of an eight-story modern cold storage plant, for the Sheriff Street Market and Storage Co., and adjoining the present market. The ground plan of the building is 113 by 117 feet, and work on the foundry is well under way. The building is designed to contain over 1,000,000 cubic feet of storage space.

Prominently allied with the concrete building block industry, not only in this city, but throughout the country, is the Standard Sand and Machine Co., of Cleveland. The company has been in operation for four years and during that period has established a very large, growing and prosperous business. The output generally covers the field of cement moulding, screening, mixing and elevating machinery; in fact, the entire equipment for this line of work, suited to the economical, rapid and successful manufacture of artificial building stone and cement construction. Their Simplicity Building Block Machine is in high favor with the block manufacturers of this city, and is sold in all parts of the country where the

(Continued on Page 50.)



WATERWORKS, CHARLOTTE, N. C., CHIMNEY 100 FEET HIGH, MADE ENTIRELY IN PALMER CONCRETE BLOCKS.



The United Cement Machinery Mfg. Co.

COLUMBUS, OHIO.

Manufacturers Under the Patents of Palmer, Winget, Sanderson, McDowell and others.

The Palmer Hollow Block Machine, The Winget Hollow Block Machine, The Chicago Hollow Block Machine,
And a Great Variety of Other Machines.

We Carry in our Immense Ware Rooms of 33,000 square feet a full Line of the Following:

Side Face Machines,
Face Down Machines,
Concrete Mixers,
Cement Block Cars,

Cement Brick Machines,
Sidewalk Block Machines,
Roof Tile Machines,
Pneumatic Tampers,

Cast Pallets, any size,
Cement Tile Moulds,
Cap and Ball Moulds,
Special Moulds,

Bronze Sidewalk Tools,
Name Stamps and Letters,
Name Plates to Order,
Weatherproof Colors.

WE HAVE ALL the practical, up-to-date concrete machinery on our demonstration floors. WE
PAY THE RAILROAD FARES of all prospective purchasers. We demonstrate any or all machines.
If they are not satisfied we have the best we pay the fares JUST THE SAME.

WRITE AT ONCE FOR OUR 80-PAGE CATALOGUE, "Department C."



The Improved Tempered Impinging Flame

WE are prepared to install for you an efficient equipment which will save you money.

Moreover we give you an iron clad GUARANTEE that our equipment is free of infringement of any and all patents for the burning of cement.

Which would it be, were you to have the choice, (1) of paying a three cent per barrel tax, as a **bonus** to a business rival, on your present methods of production— or (2) of paying us a small fraction of what we can save you by **our** improved method, as a modest return for such saving and for the **absolute protection** because of its use from costly patent suits?

IF you had a **valid basic patent** controlling the cement industry and had spent **tens of thousands** of dollars and **five years** of strenuous effort to bring a suit under it to a final hearing before the Circuit Court of the U. S. and had argued the case pro and con for **five days** before an able Judge of that Court, and had waited nearly **three months** while that Court was preparing and was about to announce to the world its opinion of the scope and validity of that patent, **WOULD YOU**, if you believed you were about to receive a sweeping vindication and an indisputable right to peremptory preliminary injunction against every coal-burning cement manufacturer in the United States — we say, **WOULD YOU** precipitately **withdraw** your suit and telegraph the Judge to withhold his decision and to **dismiss** the suit?

If you should learn of a patent having **SUCH** a record would you be afraid of it or merely amused?

Combustion Utilities Co.

THE IMPINGING FLAME PIONEERS

60 Wall Street

NEW YORK

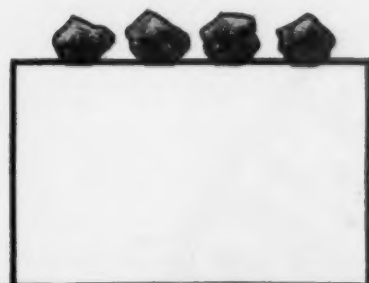
CEMENT MANUFACTURERS

IMPINGE THE FLAME!

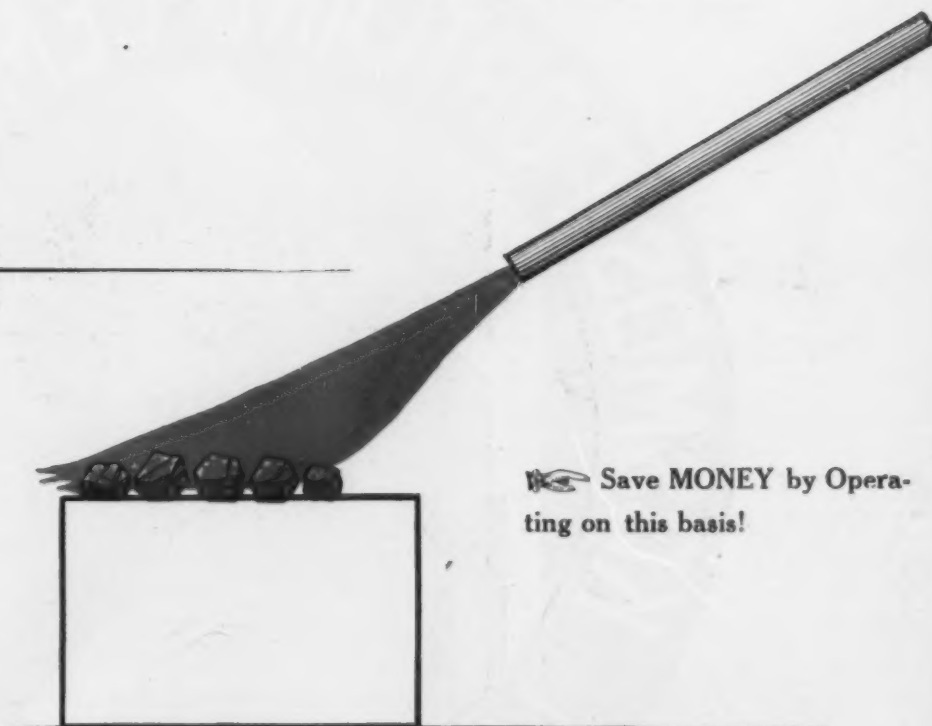
THE NON-IMPINGING FLAME.



THE IMPINGING FLAME.



Don't waste FUEL by
Employing this old Inefficient
Principle.



Save MONEY by Opera-
ting on this basis!

Upwards of seventy-five United States Patents have been granted us on our Combustion Inventions and more are coming. They absolutely cover and protect us and our licenses.

We have lately taken orders from a large number of Cement Manufacturers for the equipment of their Rotary Kilns with our Tempered Impinging Flame System. Why not join those who have found our equipment to be the best the market affords?

Combustion Utilities Company,

"THE IMPINGING FLAME PIONEERS"

60 Wall Street,

NEW YORK



BIG CONCRETE SEWER.

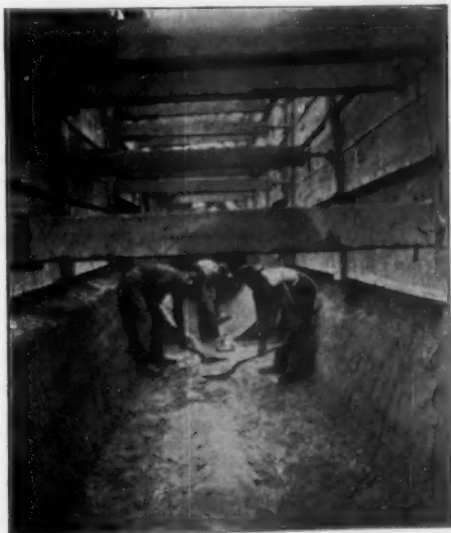
Pittsburg Contractors Installing Largest System of New Construction Built in That City.

ALSO WORKING IN DAYTON.

PITTSBURG, PA., December 16.—There is under course of construction here what is an innovation in sewer construction in this part of the country. The sewer empties into the Monongahela river, and is only about 4,000 feet in length, but on account of the conditions, it must necessarily be constructed of the strongest, and at the same time of the most sanitary material attainable, and the engineers in charge of the project naturally turned to concrete, which has been used rather extensively in other parts of the country for a like purpose. There has been a small amount of concrete pipe construction in Pittsburg, but this was for the carrying of water, and there was practically no danger of corrosion from any cause, but in the case of this sewer, the case was different, materials from a number of the mills being conducted into this passage to the river. It is said by authorities that this is the first concrete sewer of any size over a few inches that has been constructed here. From the outlet, to the beginning, the sewer is either four or five feet in diameter, about half of the distance being of each of the two sizes. It starts at Twenty-seventh and Carson Streets, South Side, runs along Carson Street to Twenty-fifth, and down Twenty-fifth to the river. M. O'Herron & Co., of this city, are the contractors, and the contract amounts to something over \$50,000.00.

The construction of a portion of the five foot line, which has 8 inch walls, and contains .513 cubic yards of concrete to the lineal foot of sewer is shown in one illustration. This is all laid on a concrete foundation which is about a foot in thickness, laid over ashes at the bottom of the ditch. The concrete foundation is permitted to thoroughly set before the work is started on the construction of the sewer proper.

The concrete for the sewer is poured between two sets of wooden moulds, which are made after a system of the contractors, in four easily detachable sections. These connect perfectly, and in order to remove any or all of the sections, all that is necessary is to knock out a few wedges and pins. The ditch ranges in depth from 13 to 19 feet, while the width is but from 6 to 7 feet, leaving but little room on the side of the sewer, which is five feet wide, inside measurement, and the walls take up an additional 16 inches, which leaves but eight inches working space on the sides, without allowing for the thickness of the moulds.



CONCRETE FOUNDATION FOR 5-FOOT SEWER IN PITTSBURG, PA.



SPECIAL OVERHEAD TRAMWAY FOR REMOVING DIRT FROM DITCH AND FOR CARRYING AND DEPOSITING CONCRETE FOR PITTSBURG, PA., SEWER.

The four foot sewer has walls 6 inches in thickness, and there are .308 cubic yards of concrete required for a lineal foot.

There are from 60 to 75 men employed on the contract, which will be completed this winter. Everything to rush the work has been done from the time it was started, and a photograph gives an idea of the method of excavating, as well as carrying and depositing the concrete. A steam Carson excavating machine, operated on a high trestle track direct above the ditch, removed the dirt from the ditch, carried it back along the line, and deposited it in the portion of the work



SHOWING CONSTRUCTION OF 5-FOOT CONCRETE SEWER IN PITTSBURG, PA.

that was completed and ready for filling in. Much unnecessary handling of materials was avoided in this manner, and much time saved. Ten ordinary one-yard buckets were used, and were operated from the car on the top of the track. To the left of the photograph may be seen the "Smith" concrete mixer, the only mixer required on the work, it being able to furnish the mixture for both the foundation and the sewer as rapidly as called for.

The total amount of excavation amounted to about 55,000 cubic yards, and there were about 2,500 yards of concrete work. "Atlas" and "Sailor" Portland cement were used.

M. O'Herron & Co. also have several large contracts for sewer work at Dayton, Ohio, where they are installing the entire sewer system for the unsewered parts of the town. In the districts just completed, the contract called for about \$225,000.00 worth of work, which was in what is platted as Districts 6 and 7. There was about 600,000 yards of excavation on this portion of the contract, with 50,000 yards of concrete work. In addition to this, there was an unusual amount of bracing of the walls of the deep ditch, on account of the loose formation of the soil. This caused considerable trouble, for a portion of the sewer was a 7 foot 6 inch concrete egg shape sewer, for which a ditch 12 by 21 feet was necessary, and the danger of caving in was too great to risk. The method of bracing was the same

as seen in the accompanying illustrations, and the same method of excavating and carrying concrete was used, all machines being of the same makes.

The concrete work on the Dayton contract consisted of 200 ft. of circular concrete sewer, 1,300 ft. of 3 ft. 8 in. by 5 ft. 6 in. egg shape sewer, 4,790 feet of 5 foot by 7 foot 6 inch egg shape sewer, 12 concrete manholes and 242 lamp holes. The total cost of the concrete work was about \$165,000.00.

The remainder of the contract included 113,310 feet of 8 inch pipe, 7,020 feet of 10 inch pipe, 1,410 feet of 12 inch pipe, 6,668 feet of 15 inch pipe, 4,120 feet of 18 inch pipe, 1,230 feet of 20 inch pipe, 2,290 feet of 24 inch pipe, 2,500 feet of 5 inch pipe, 96 feet of 12 inch iron pipe, 432 feet of 16 inch iron pipe, 14,630 feet of lead pipe, 290 brick manholes, 177 flush tanks and 1 large sewer junction.

This contracting firm has just been awarded another important contract for the sewer system at Dayton. This contract is for a 12 foot 3 inch concrete sewer, and work is just being started on it. The sewer will be egg shape, and will be 9 feet wide by 12 feet 3 inches in height. This will be one of the largest sewers of concrete that has ever been constructed in the United States. The contract will approximate \$125,000.00, and will be completed this winter. As in all of the other work, the firm will use moulds made by itself, and from their special patterns.

The portion of the sanitary sewer system that has been already completed has proven most satisfactory according to the reports from the city officials, and during next summer there will be contracts for several other sections awarded, all of which will be of similar construction. F. M. Turner, Dayton, O., is the city engineer.



SILLO, GEDNEY FARMS, WHITE PLAINS, N. Y., ATLAS CEMENT USED.



SPAN OF TIBER BRIDGE, TIBERIAS, ILL., CHICAGO A. A. PORTLAND CEMENT USED

Experiments With Ferro-Concrete.

The *London Engineer* publishes in abstract the results of some interesting experiments on re-inforcing concrete by means of metal by M. Considere. In his earlier work M. Considere endeavored to rationalize the re-inforcement of masses of concrete against tensile strains by means of metal bars; but his later experiments have been concerned with the question of increasing also the compressive strength of such masses by a suitable distribution of metal. He finds that the most economical method of strengthening a concrete column is to lap it round with wire, metal used in this way being from two and a half to three times as efficient as an equal weight arranged as straight bars parallel to the line of thrust. A number of cylinders 40 millimeters (1.57 in.) in diameter were moulded out of a mixture of 400 kilogrammes (881 lbs.) of cement, with 1 cub. meter (1.31 cub. yds.) of sand, and were wrapped with fine wire, the volume of the latter being 0.034 per cent of the total volume. These were tested by crushing at different ages, from eight up to one

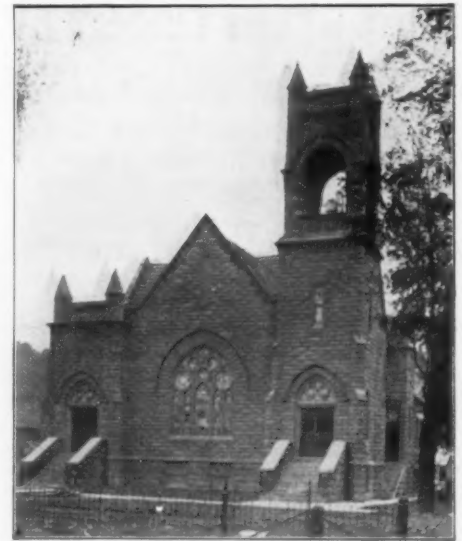
hundred days. Similar specimens without the iron were also moulded and tested, the comparative results obtained being as follows:

Age of specimens, days	8	14	22	23	100
Crushing stress, pounds per sq. in. with iron re-inforcement	4,846	6,543	7,568	4,935	10,525
Crushing stress, pounds per sq. in. without iron re-inforcement	569	711	853	853	2,418

Weight for weight, the hundred-day old re-inforced cylinder is very nearly as strong as iron. In some further experiments the cylinders tested were 15 centimeters (5.90-in.) in diameter, and varied in length from 0.50 meter (19.7-in.) to 1.30 meter (5.11 in.). The mixture used was 0.800 cub. meter (1.046 cub. yd.) of gravel, 0.400 cub. metre (.523 cub. yd.) of sand, mixed with, in some cases, 300 kilogrammes (661 lbs.) and in others 600 kilogrammes (1,323 lbs.) of cement. The short specimens were tested in the laboratory of the Ecole des Ponts et Chaussées. The block without iron failed at a load of 1,052 lbs. per sq. in., whilst another, which was wrapped with a spiral of hard drawn iron $\frac{1}{4}$ inch in diameter, wound to a pitch of 1.18-in., did not fail until the stress reached 5,120 lbs. per sq. in.; and a third in which the wire used was 0.167 in diameter, wound to a pitch of .59-in., did not fail under a load equivalent to 5,405 lbs. per sq. in., which was the maximum the testing machine was capable of exerting. Another cylinder, in which the bulk of the metal was in the shape of longitudinal bars, failed at a stress of 2,418 lbs. per sq. in. M. Considere states that the latter prism, as well as the specimen without iron, both failed suddenly, whilst with the spiral-wound blocks failure was very gradual. It was further noted that in the best of the spiral-wound blocks the amount of compression was considerable, being as much as 3.55 millimeters per meter before any signs of cracking could be observed.—*Canadian Architect*.

Farmer Buys Block Machine.

BUTLER, Mo., December 6.—Mr. M. N. Lester says, "There is not much doing in the building line just now. I am putting in considerable improvements and have an old style jaw crusher that I would like to dispose of. An enterprising farmer near here bought a block machine last summer and made his own blocks. He is putting up a fine residence. Concrete is being used more every day for residences, all manner of foundations, bridge piers and the like, and as soon as we succeed in getting freight rates on fine screening from Webb City and Joplin upon an equitable basis, there will be lots more of concrete work done here."



METHODIST EPISCOPAL CHURCH, LITTLE VALLEY, N. Y., BUILT BY THOMPSON CEMENT STONE CO., TOWANDA, N. Y.

CONCRETE IN CLEVELAND.

(Continued from Page 44.)

manufacture of blocks is carried on. H. G. Boughton, general manager, said they were very busy and crowded with orders.

One among the largest concerns engaged in its line of business, is the Atlas Car and Manufacturing Co., corner of Marquette and Hamilton Streets, in this city. Their line of products covers the field for cars, switches, turntables, rails, wheels, axles, stone carriers, etc., for quarries, mines, cement works and any use to which such articles may be put. They pride themselves on the excellence of their work, and their rapidly increasing business is the highest commendation they could ask.

In the line of industrial railroad equipment, The Cleveland Car Co., corner of Lorain Street and the Lake Shore Railroad, stands foremost. They are doing an extensive business in the construction of cars, rails, switches, etc., for concrete and cement plants, quarries and mines. A plant equipped with an outfit from their establishment will be safe in its operation and afford the owner entire satisfaction.

Among the most prominent engaged in the business in this city, is The Cleveland Builders' Supply Co. They are dealers in builders' supplies generally, such as cement, fire clay, pipes, etc., but they make a specialty of their popular brand of Excelsior Hydrated Lime, which, it is claimed, is absolutely pure and free from foreign ingredients and will not deteriorate. The company has supplied large quantities of this lime during the past season. The manager stated their business was excellent at the present time, for this season of the year, and that the outlook for 1907 was good.

One of the important things in building is to secure a good, and certain to be lasting, roof. Parties in this city who have used Garry's Genuine Charcoal Iron Roofing, and who have had years of experience with it, indorse it as possessing the very highest merit. It is manufactured exclusively by the Garry Iron and Steel Co., of this city, and their product amounts to hundreds of tons yearly.

A new enterprise for Cleveland, the Runyan Concrete Machinery Co., just organized under the laws of Ohio, has located its offices and factory at 704-S Canal Street. The officers of the company are: F. A. Smith, president; G. H. Macey, vice president; H. Grotenrath, secretary-treasurer; C. M. Runyan, general manager. The company has equipped a complete plant for the manufacture of concrete machinery.

The Indianapolis Mortar and Fuel Co., 13 Virginia Avenue, Indianapolis, Ind., are about to erect a hard wall plaster mill, and are in the market for the proper equipment for same.



CONCRETE BRIDGE, ZOOLOGICAL GARDEN, WASHINGTON, D. C.; LEHIGH CEMENT USED.

Let the Whole Truth be Known.

Many times in the past we have called attention to the short-comings of the unprepared manufacturers of concrete blocks and bricks and are proud to be able to report that such criticism has been taken in good part and resulted in the inauguration of enormous improvements in the practical development in those important lines of concrete work.

The reinforced concrete branch is being harassed with a drove of superficial engineers who, starting with a hypothetical assumption of certain qualities of cement and steel in combination, have worked out tabulations of stresses and loads, of co-efficients and structural factors. This appeals to some practicing architects who are uninformed themselves, and either unable to or averse to undertaking the problem of working out concrete equations of their own to be applied in important construction where they are employed, by reason of their established reputations gained in the older lines of building construction.

We say harassed, because the concrete contractor is literally loaded down with calculations from alleged engineering concerns, all advocating some special brand of reinforcement material named with a uniquely worded phrase, such as "twisted bars," "corrugated bars," "stamped steel," and the Lord only knows what not. All of these set forth that the specific virtue of the "system" is to be accomplished solely by the use of steel made up in their own particular form. It is usually cheerfully explained that the material to be used in the "system" costs only 15 to 25 per cent more than plain rolled steel, and as, in fact, it costs practically no more to make than plain rolled steel, there seems to be no good reason for paying this or any other premium, unless the "system" is able to demonstrate that it offers some structural value as yet unknown to science.

It is significant that the first great buildings, which successfully introduced reinforced concrete construction to a position in the building world where it can never be displaced, were built with plain steel rods, without any "system" assistance, and that the failures of reinforced concrete work, without exception, have been "system" built jobs.

When the Ingalls building was put up in Cincinnati the only "system" that had at that time been introduced consisted of laying plain bars in the concrete by a method found by practice to give certain structural results, and the rigid tests that were made upon this building, reported so often in print, assisted materially in the now world wide confidence in reinforced concrete.

The failure of the great Bixby Hotel at Long Beach, Cal., and the Eastman Co.'s factory at Rochester, N. Y., during the month of November, to say nothing of the Peoria chimney incident, or a number of lesser buildings in other places throughout the country, all invariably check back to the employment of some one of these "systems" and one of two distinct deductions must be drawn: The various patented systems for applying steel reinforcement in the structural members of concrete buildings are either intrinsically inefficient



ECKERT RESIDENCE AT LOUISVILLE, KY., DESIGNED AND BUILT UNDER THE PERSONAL SUPERINTENDENCE OF R. CULLEN, ARCHITECT. PORCH COLUMNS AND STEPS AND STEPS OF MONOLITHIC CONCRETE.

and false in basic calculation, or they have been in some instances at least, ineffectual and unskillfully employed. Either of these causes is directly chargeable to the engineers conducting the "system" as the responsible parties, and not the contractor.

The purpose of people exploiting "systems" has not been that of true engineering, recommending material only for such uses as it is fitted, but to dispose of as much material as possible by forcing its use in every conceivable way. The result of this practice has been the use of expensive reinforcement in many places where a monolithic wall would have served the purpose equally well, and in other places on account of a scanty appropriation of money, reducing the amount of reinforcement to still secure a profit from the work.

The surprising high qualities of concrete as a building material have in thousands of cases, overcome such elements of inefficiency, but it is asking too much to load it down with unproved calculations, carelessness and high cost.

There is practically no limit to which reinforced concrete construction can be carried under the superintendence of careful and competent engineers, who have studied out the simple but indispensable problems for themselves, with due regard to well accepted mathematics which builders have used for ages. There is no such thing as merchandising in reinforced concrete construction. It is an engineering proposition, pre-eminently such, for the builder manufactures his material as his work progresses, and naturally the inspection of such work has to be intrusted to an expert who measures its advancing progress, minute by minute.

All that we have said about preparing the materials; the mixing, the tamping and surfacing of concrete are applicable to this point, if high results are to be obtained in every concrete undertaking. Besides all this, the concrete engineer who directs and inspects the work must know for himself the value of every principal, as well as every auxiliary bar or truss or structural unit that he is putting into the work, so that dangerous substitutions for the specifications of the original plans may be avoided.

The concrete industry wants all the light obtainable from well qualified engineers, and is suffering from the practical truth that is being developed by the thousands of works that are daily being brought to completion. There is no doubt if nothing was withheld, that all the testimony

would elevate concrete in the opinion of structural experts everywhere, if such a thing is possible, and some at least of the so-called "systems" would have to go.

Anent the Bixby Hotel catastrophe, Mr. H. A. Schulze, chairman of the California State Board of Architects, embodies the following remarks in his report:

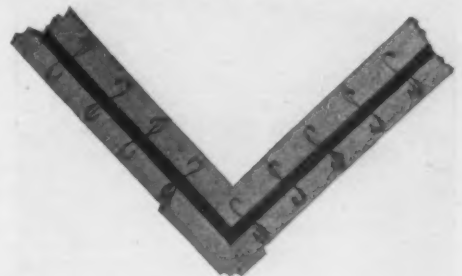
"Accompanied by an assistant, I carefully inspected the collapsed portion of the building. The original drawings by the architects for the reinforced concrete construction (except the several floor columns) were not followed, but were superseded by an entirely different and patented "system" of reinforcement, submitted by the patentee through the contractor and adopted by the owner, the special merit claimed in the substitution being that the patented system lessened the dead load of construction to about 85 per cent of the "system" advocated by the original drawings.

"It would seem that this substitution was not made on the part of the owner for the purpose of saving, for the contractor was to have been paid a considerable increase on his original contract price for the change. Therefore the attraction to the owner must have been other than financial, though it would seem to have been ill advised, which no doubt added materially to the large extent of damage, and the fatalities accompanying the destruction.

"A careful inspection of the premises in the basement fails to reveal any settlement of the foundations or similar cause for the collapse. The concrete was of very good character, and no ad-



WALL CONSTRUCTION USED IN THE ECKERT RESIDENCE AT LOUISVILLE, KY.



WALL CONSTRUCTION USED IN THE ECKERT RESIDENCE AT LOUISVILLE, SHOWING ENCLOSED AIR SPACE AND METHOD OF BONDING.

verse criticism could be justly made against it. The character of the workmanship was fairly good in the basement and first story, becoming inferior by degrees upward until there was a very marked degeneration in quality in the top story.

"All floors, except the first, were constructed over large spars with light reinforced concrete joists spaced about 18 inches on centers, covered with two-inch concrete floor slabs, but not reinforced, and filled in between the joists with hollow terra cotta building blocks, which, from the very nature of things, could not be or become an integral part of the construction."

In the investigation at Rochester, the value of the structure equations was barely reached in the overwhelming accounts of negligent engineering. The witnesses were, for the most part, practical men who had been employed upon the job, and the gist of all their testimony is practically an admission that the work was done in a careless and slipshod manner, and looked like a second-class job. Shavings and sawdust were allowed to accumulate between the centering falsework, in this way honeycombing the concrete, and one size of rods were substituted for another that was more handy, and changes were inaugurated practically *ad libitum*.

The same tale of woe might be continued in detail with regard to all the failures that have been recorded, and it would only be a repetition of the same story.

The Bricklayers and Masons' International Union recently held a State conference in San Francisco and took occasion to make a report from their standpoint in which they attempt a sweeping denunciation of reinforced concrete construction. This is too preposterous to be worthy of our consideration, but it has been widely distributed and will no doubt prejudice the minds of a large number of people. We mention this to show the injury that unreliable engineering and bad practice may bring down upon the industry by "system" men who are riding rough shod over the building public, with their mysterious figures and carelessly applied "systems" of construction.

If there is any merit in what they have patented and offer for sale, let it appear, but if plain steel rods in the hands of capable engineers, properly applied, will produce the highest class of construction, then away with all sophistries and pretenses and let the investor have the benefit of the best obtainable at the lowest price.

These impersonal remarks are merely suggestive of the trend of thought now forming in the minds of men who are the real leaders in reinforced concrete construction. It will grow and there will be more anon.

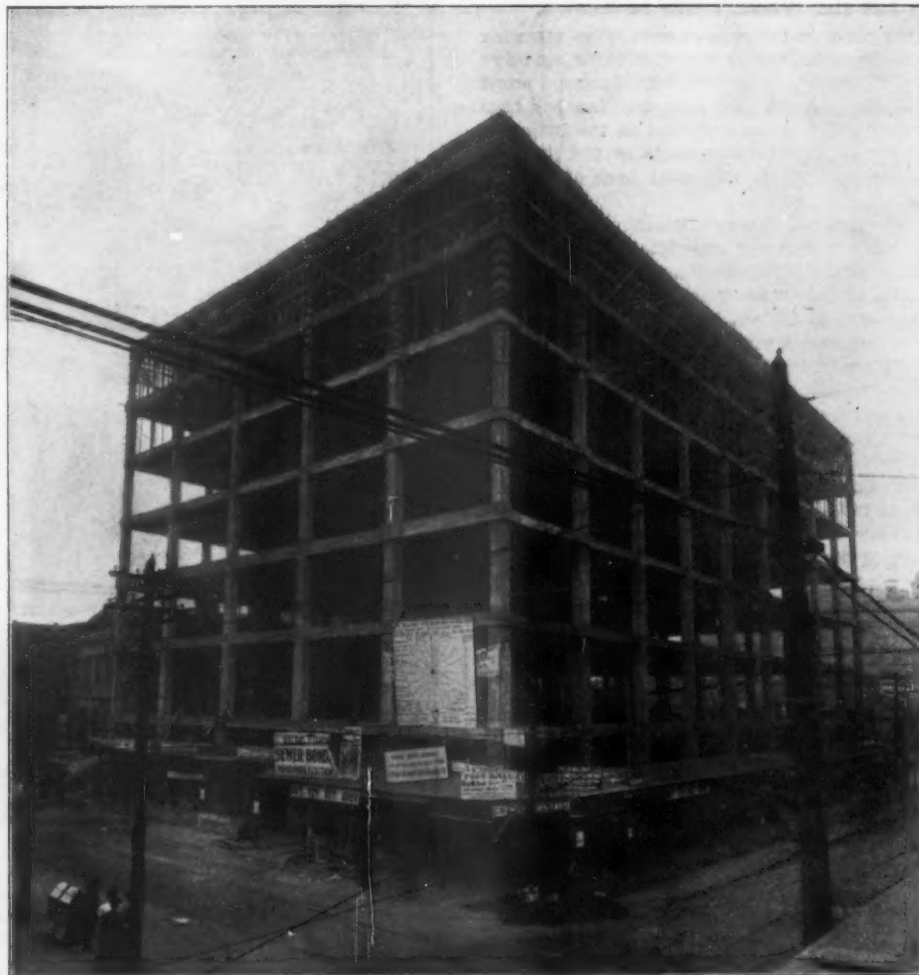
The Point of View.

The National Board of Fire Underwriters since the universal introduction of concrete construction, have become quite enterprising with their suggestions in regard to fire protection by means of automatic sprinklers in commercial buildings of every description, and pledge the assistance of their expert engineers for the purpose of showing the public how to reduce the insurance charges. They have absolutely nothing to say with regard to the adoption of concrete as the exclusive building material which requires no insurance at all, and for that reason it is somewhat cheaper than anything they suggest.

When the Greeks come to Troy to sell you a horse, think it over.



RESIDENCE AT FRESNO, CAL., WORSWICK STREET PAVING CO., CONTRACTORS.



BUILDING FOR STEWART DRY GOODS CO., LOUISVILLE, KY. KOSMOS PORTLAND CEMENT USED. SELDEN-BRECK CO. GENERAL CONTRACTORS.

Waterproofing Compound.

The Roesling Co., 233 Fifth Street, Louisville, Ky., are announcing for the first time their fluid compound, which has been proved to be a quite inexpensive ingredient to be used in connection with the manufacture of cement products. They guarantee where it is properly mixed and applied according to their instructions that an absolutely water-proof cement surface is produced, at the same time the crystallization of the cement in the building block, or brick, or concrete floor is not arrested, but on the other hand, assisted to completion.

The fluid can be applied with a brush like a coat of paint, but it has no effect upon the color of the concrete mass. They have carefully experimented with and proved the efficiency of their compound in every practical way, covering a number of years with the experiments so that the compound as presented is a finished, well tested and reliable, practical solution of nearly all of the difficulties which remain to bring the concrete industry to perfection. It does away with efflorescence entirely, and the name of the compound, "Nodam Pwall," indicates the chief virtue which they claim for their product, namely, that when it is properly used it is impossible for a drop of water to be made to penetrate the outside surface of the block or brick. The cost of their formula is nothing as compared with the results that can be obtained, and as the manufacturer is placed in absolute control of his own business, by securing the formula and making his own compound, there is no "blue-sky" connected with their proposition. It is well worthy of the consideration of those who have experienced any difficulty from dampness on their finished work. It can be applied to the finished job, the same as at the time of manufacturing the brick or block.

The Atlas Portland Cement Co. is building a concrete storage bin for coal supply for their great plant at Northampton. It will have a capacity of 100,000 tons of coal.

Reinforced Concrete Walls.

CHICAGO, ILL., December 20.—The largest single building in the world is to be erected by Montgomery Ward & Co., in this city. The structure will be 269 by 717 feet, eight stories high and will cost \$1,809,070.00. The building will be divided by fire walls so that there will be six sections. Each of the sections will be connected by means of iron doorways on each floor so that every part of the building will be easily accessible. Each section will be provided with three iron stairways inclosed in fireproof walls. With the exception of the floors not a particle of wood will be used in the construction. Each wall will be of reinforced concrete two feet thick. The foundations will be of concrete and the steel frame work will be anchored in concrete piling, extending down to bed rock. The structure will be provided with every convenience known to architecture and construction so that when complete it will be the largest and best equipped of its kind in the world. Lack of shipping facilities has made necessary this move to the north side. In this location on Larabee Street and Chicago Avenue they will have the advantage of a railroad track into the building and a frontage on the river. Work on the building will commence early in January, the weather permitting, and it is expected to be complete by July, 1907. The architects of the building are Schmidt, Gordon and Martin, who will supervise the building operations.

Reinforced Concrete for Piers.

Dubuque, Iowa, December 7.—The Dubuque and Wisconsin Bridge Co. recently made a contract with A. Y. Bane & Co., of Minneapolis, Minn., to build and construct one steel span 324 feet in length and 18 feet wide, to take the place of 324 feet of wooden trestle work. It will necessitate the building of two piers 31 feet high by 6 feet in diameter, of reinforced concrete. The work is to be completed by March 15 and guaranteed to carry a moving load of 40-ton interurban electric cars.

Very Satisfactory Investment.

GLENS FALLS, N. Y., December 17.—Dr. Lemon Thomson has just completed the construction of a very handsome business block, using cement brick for all the walls, a good picture of which is shown upon this page. The size of this building is 126 feet front by 53 feet deep and cost approximately \$30,000.00. 170,000 sand-cement brick were used in the building and were made by using a mixture of four of sand to one of Portland cement. These bricks were made by the Sand-Cement Brick Co., of Glens Falls. The architect was W. C. Oliver, who was also the superintendent of the work.

Speaking of this block, Dr. Thomson says: "The sand-cement brick is entirely new to this section, and the company making these brick is an interest of my own, for I am the president of the company. I looked for a chance where I could try and place some of the brick for inspection, consequently I purchased a lot and with the assistance of Architect Oliver, began the construction of the building. At the present date the building is completed and every part of it rented to good tenants, so that it is a satisfactory venture from every standpoint. The building is attractive and substantial, and its bright gray color being new in this section, causes it to be pointed out and the public seem to think much better of cement brick than when we commenced using it last summer."

Mixing Concrete Under Tent.

In the line with the right idea as to care in the use of concrete in cold weather, many of the up-to-date contractors are careful to have the sand and water heated to about 65 to 70 degrees F. and kept at that temperature while mixing and using. Quite an innovation has been introduced in the floor work of a large building, where the contractor has built a large tent in which the concrete is mixed, and in which steam pipes have been introduced so that the temperature will be an even, moderate one, while the concrete is being mixed and put in place. It is such consideration for details that mean much for the good results that accrue from the use of concrete under normal conditions.

Organizing Concrete Company.

BELLE PLAINE, IOWA, December 10.—William Brauch, who is engaged in the concrete manufacturing and contracting business, says: "The concrete business has been good in this section during the past season, and the outlook for the coming year is flattering. I have just completed a reservoir for the city water works of concrete construction, which is similar in character to a number of such reservoirs that I have built for the government in Germany. The reservoir is 40 feet in diameter and 9 feet deep, and will hold over 2,500 barrels."

Mr. Brauch is organizing a \$20,000.00 stock company to put up a factory to manufacture shingles, fence posts, bricks, building blocks, tombstones, etc.

Had a Prosperous Season.

PORT HURON, MICH., December 20.—E. R. Marcotte, manager of the Marcotte-Forbes Cement Brick and Tile Co., says: "We are busy at present bringing several important jobs to completion. We have had a long and prosperous season in our line of business, especially with regard to the concrete stone and brick branch."

Have Built Many Pavements.

BATAVIA, O., December 20.—Barr and Behaymer report that their work this season has been confined mostly to foundations and pavements, having such a rush of this class of work that they have had no time to devote to the construction of buildings.

Installing Block Machinery.

HUTCHISON, KAN., December 21.—T. R. Casey has purchased a complete outfit of machinery, including kilns for curing the blocks, and has begun the erection of a model plant. The Perfection Power Block Machine will be installed for the manufacture of concrete bricks and blocks.

The Norwalk Vault Co., Norwalk, Ohio, has been incorporated with a capital stock of \$15,000.00 to manufacture concrete burial vaults, and also building material. C. L. French will be the general manager of the company.



TWIN CITY RAPID TRANSIT CO.'S SUBSTATION, LAKE AND COLUMBUS STREETS, MINNEAPOLIS, BUILT OF CEMENT BRICK.

Thos. Kieran, Tompkinsville, N. Y., reports a profitable business in the manufacture and sale of concrete block. He has contracts for supplying the block for ten different buildings, some of them being large apartment houses.

Frank A. Borst, formerly president of the Ideal Machinery Co., has sold out his interest and retired from the business.

The fourth biggest chimney in the world is now being built in Chicago by N. K. Fairbanks & Co. When completed it will be 250 feet high and 15 feet in diameter at the smoke outlet. Thirty tons of steel rods will be used for reinforcement and 12,000 barrels of cement will be used in its construction.

The W. A. Crew Concrete Co., Salisbury, Md., have had their plant in operation for about one year. They have enlarged the capacity of their output from time to time, and report a steady and healthy growth to their business in the gaining popularity of concrete block.

Percy R. Lemman, of the Concrete Construction Co., Memphis, Tenn., says that his firm is at present erecting fifty new four-room concrete block houses, costing \$60,000.00, for the American Bag Co., in new South Memphis.

Barrett & Thompson, architects, Raleigh, N. C., have designed the first reinforced concrete building on the capital of North Carolina. It is a Catholic orphanage asylum, located about two miles west of the city. The building is 52x80 feet in size, two stories and a basement.

John Hanna & Sons, contractors, of Chester, Pa., put in a concrete bottom of a swimming pool for the Y. M. C. A., containing 100 square yards of surface, in twelve hours.

The Runyon Concrete Machinery Co., Cleveland, Ohio, has about completed a well equipped plant for the manufacture of cement working machinery. Their plant is located at 704-706-708 Canal Street, and C. M. Runyon has been elected general manager.

The National Stone Co., Minneapolis, Minn., has been organized by F. E. Keneaston and associates. They are at present engaged in building a factory for their plant.



BLOCK BUILT OF CEMENT BRICK AT GLENS FALLS, N. Y., W. C. OLIVER, ARCHITECT. GIFFORD & WILLIAMS, CONTRACTORS.

Mixing Concrete With Boiling Water.

NEW YORK, December 15.—The McGraw Publishing Co.'s concrete building on Thirty-ninth Street, west of Seventh Avenue, is now up to the fourth floor and naturally, the contractor, Frank R. Gilbreth, is doing his best to beat cold weather as much as possible. Concrete construction can not, under ordinary conditions, be carried on in freezing weather, but the contractor is putting into execution a little trick which is serving him well in this very cold weather, and will continue to do so till the mercury falls abnormally. When the temperature is at and around freezing point, all the concrete is made with boiling water, and is hoisted and put into place with rapidity while it is yet steaming hot.

In addition to this, that part of the building upon which this work is progressing is shielded with canvas on the floor below the one on which the concrete is being placed, and within this enclosure are placed a dozen salamanders or plasterers' furnaces. This keeps warm the floor above, and with the use of hot water in the concrete, allows the material to set before the frost can affect it. Additional precautions are also taken by covering the concrete with hay and tarpaulins. It has been shown by tests that the concrete continues to harden for several days after it is made, but it sets sufficiently within a very few hours to be free from many serious defects from frost, so that unless the weather becomes unusually severe, work upon concrete buildings need not necessarily be interrupted.

Berthelett Concrete Stone Co., Milwaukee, Wis., has been incorporated with a capital stock of \$25,000.00 by J. R., W. T. and V. E. Berthelett.

The Martinsburg Concrete Block Co., Martinsburg, W. Va., are getting out material for the erection of the school building at Kearneyville.

J. M. Guy, Laurel, Miss., has a contract for the erection of a concrete stone building 30x90 feet for Corlier Bros. It is the first building of the kind to be erected in that locality.

The Keystone Cement Block Co., Allentown, Pa., have been notified that their building blocks have passed the specification of the Philadelphia Bureau of Building Inspection, which gives them a privilege of selling their product in the city of Philadelphia.

The Niagara Falls Brick and Sand Co., Niagara Falls, N. Y., has been incorporated with a capital stock of \$50,000.00, by Frank G. Klick and associates to manufacture cement brick and concrete block.

The Long Beach Sand Brick Co., Hempstead, L. I., has been organized for the purpose of manufacturing cement and sand brick from the beach sand of Jones' Inlet.

BRICK BATS.

To make good blue brick is to use the plastic system.

The oblong kiln is in favor in England.

When you burn tiles, don't be in a hurry to close the kiln.

Rope hauling is Koppel's specialty.

To make roofing tiles, use cement and sand.

If some of the English brickmakers could be imported, it would help our friend, the brick maker in this country.

Competition with paving brick manufacturers has been found detrimental, because to cheapen the price often cheapens the grade, and a street made of brick that is not well made is worse than poorly made asphalt.

The demand for brick in Panama is greater than the supply.

Prussia employs 30,000 women in their ceramic industries.

H. Schnurpel, in a recent article, said, "Owing to the particular demand for fire brick in Germany, greater care is taken in the manufacturing of the product."

The drain tile business of the West is growing.

The brick manufacturers are good fighters.

They sometimes advertise their competitors, however.

With the large increase of business in concrete manufacturing it behooves the brick manufacturers to do more promoting.

PATENTS FOR CONCRETE INDUSTRY FOR 1906.

Rock Products publishes this month the more important of the patents granted to men who have made a study of the concrete industry. This list, aside from being interesting in itself, shows the great progress that has been made in the industry during the year. Concrete construction has grown with rapid strides the past year and promises greater growth in 1907. The list follows:

Method of Making Pipes or Artificial Stone.—By Joseph Hall. No. 809,680. Jan. 9, 1906.

This is a method of feeding concrete into a mold capable of being set in rapid rotation and under the action of centrifugal force, the concrete moves outward, permitting the rapid formation of the pipe. The mold is adapted to allow the rapid escape of water resulting in a dry and stiff formation, easily removed from the mold. A core, with sections pressed together by external springs and having a limited outward movement, is provided. This is introduced axially while the mixture is rotating rapidly and forces it outward against the sections of the mold. Metal and wire are used in proportion to strength required.

Tile Molding Machine.—By Allen Glenn. No. 809,940. Jan. 16, 1906.

The features of this machine are in the immediate removal of the molds and the possibility of using any desired size, also the thorough tamping, enabling a quicker working of the mass.

Sand or Clay Screen.—By L. P. Shafer and C. Davis. No. 810,682. Jan. 23, 1906.

A screen of suitable frame, the side members consisting of channel bars, means of holding the side members in proper spaced relation, a tension head provided with tension bars located in different horizontal planes, a series of screen wires held in fixed relation with reference to the frame at one of its ends and secured to independent adjustable wire-holding bars at their opposite ends, the bars located in series and in different planes, and a bridge bar located intermediate the ends of the screen wire, and means for adjusting the bridge bar to and from the screen wires.

Press for Molding Cement or Plastic Blocks.—By C. A. Meyers. No. 811,423. Jan. 30, 1906.

A press comprising upright rods, a fixed platen adapted to be held at various positions on the rods, an upper platen slidably mounted on the rods, a plate or frame connecting together and bracing the rods at upper ends, links pivotally connected to platen and joined to suspended links, pitman pivotally connected with links where they are joined together, and a rotatable shaft provided with eccentrics to which the inner ends of said pitman are connected on opposite sides of said shaft.

Building Block.—By F. McM. Sawyer. No. 812,369. Feb. 13, 1906.

This invention provides an artificial stone building block molded U-shape with a smooth inner and outer surface and can be laid so as to provide vertical air passages through the walls and brace and tie them at the corners.

Press for Concrete Building Blocks.—By J. A. Ferguson. No. 812,416. Feb. 13, 1906.

This invention provides a simple and efficient press in which the mold is so mounted and disposed that it may be swung into a horizontal plane, so that it may be filled and then swung into position in the press. The mold is inverted to discharge the block, and then be automatically thrown into normal position.

Rock Drill.—By C. J. Smith. No. 812,375. Feb. 13, 1906.

This drill is so arranged that it can be mounted on an arm, column or post and when set in position to bore will not have to be changed in any way from the alignment of the hole in order to change bits. Means are provided for automatically feeding the drill as fast as it cuts the material. The drill can be worked at all angles.

Sand Drier.—By S. A. Wilson and E. A. Bronson. Newburgh, N. Y. No. 813,191. Feb. 20, 1906.

The object of this invention is to provide a simple method of drying by artificial heat. Steam is turned on to a coil in the chute. The sand is distributed from a vibrating hopper and slides down in close proximity to or against the hot steam pipes. The moist vapor rushes into a hood and is drawn off continuously by an exhaust fan. The vibration prevents clogging and keeps the material in motion. Access to the chute may be had at all times, even while the apparatus is in operation.

Building Block.—By J. Lovett. No. 814,973. March 13, 1906.

The object of this block is to prevent the passage of moisture by utilizing a plurality of dead air spaces. They may be tied horizontally by reversing the position of the outside and inside block, alternating wide and narrow blocks in adjacent layers or at intervals.

Rotary Cement Kiln.—By H. Hitzel. No. 815,705. March 20, 1906.

The features of this invention relate more especially to an apparatus for injecting finely pulverized carbonaceous fuel into a rotary cement kiln by means of a current of hot air. To this end the invention consists in the combination with the kiln, of a rotary blower, an inlet pipe leading from a source of supply of hot air into the blower,



HANGING CONCRETE STAIRWAY IN MILLIGAN & MILLER BUILDING, WILKINSBURG, PITTSBURG, PA. DEXTER PORTLAND CEMENT CO.

means of feeding into the latter a uniform quantity of fuel in finely powdered form and an outlet pipe from said blower for the hot air and fuel, which pipe leads into the kiln.

Apparatus for Lining Tunnels with Concrete.—By J. W. Reno. No. 816,040. March 27, 1906.

The object of this invention is to carry the work of lining step by step simultaneously with the driving of the heading and to keep the lining work close to the heading. The heading is driven far enough to afford sufficient space within the completed tube in the rear for concreting purposes. Material cars are operated over a bridge and platform and the concreting conducted thereon until the arch for the length of platform has been finished.

Cement Block Machine.—By C. F. Davis. No. 818,439. March 27, 1906.

Blocks made by this machine have a plurality of vertically disposed air flues to prevent the entrance of frost and moisture to the inner face of the block when it is laid into the wall.

Calking Apparatus for Tunnels.—By E. W. Moir. London, England. No. 824,668. June 26, 1906.

This apparatus is mounted at the end of the revolving arm and consists of a hydraulic cylinder, having a piston at the end of which is attached the tool. It is so constructed that the calking medium may be round lead wire which is carried on a spool on the staging and is led around in front of the roller so that as the roller advances around the seam it forces the lead into the seam in front of it. A pneumatic hammer is more desirable if iron is used as a medium.

Building Block and Wall Constructed Thereof.—A. O. Thomas, Kearney, Neb. No. 826,388. July 17, 1906.

A concrete block so constructed as to prevent moisture from passing from front to back of wall at any point.

Machine for Making Concrete Blocks.—By H. S. Palmer, Washington, D. C. No. 828,767. August 14, 1906.

An automatic machine for the making of concrete blocks.

Rock Drilling Machine or Engine.—By H. Hellman and L. O. Bayles, Johannesburg, Transvaal. No. 829,071. August 21, 1906.

This invention produces a machine of small dimensions and of compact and simple construction. The valves and other vital points are well protected from damage usually due to rough handling.

Apparatus for Making Cement Clinker.—By Byron E. Eldred, Bronxville, N. Y.—No. 829,967. September 4, 1906.

A clinker making plant, the combination of an internally fired calcining kiln provided with regulable means for controlling the rate of feeding the material and the separately heated clinkering means.

Concrete Wall Forming Apparatus.—By Harry P. Engelhardt, New York, N. Y. No. 830,893. September 11, 1906.

This device is provided with standards with channels, base bars on which standards are mounted, mold plates or boards adapted to engage their ends in channels and a spacing block removably engaging with the standards.

Reinforced Concrete Construction.—By G. L. Peabody, Pittsburg, Pa. No. 832,557. October 2, 1906.

This invention consists of a main notched bar and a tie element surrounding the bar, and in holding engagement with the notches thereof, is looped around an anchoring body of concrete and crossed in opposite directions.

Reinforced Bar for Concrete Floors and Beams.—By Joseph Babiczky, Kansas City, Mo. No. 832,583. October 9, 1906.

A corrugated bar to produce a part of reduced width and increased depth of thickness at any number of points of a truss arm projecting upward from the bar and outward toward its contiguous end, and provided at its lower end with a loop engaging the bar at the points of reduced width and increased depth with at least one-half loop having its side portion extending diagonally of one of the corrugated points and its ends engaging the top and bottom of the bar.



MAUSOLEUM, CEDAR HILL CEMETARY, PORT JEFFERSON, N. Y., BUILT OF PALMER'S PATENT HOLLOW CONCRETE BLOCKS.

SAND-LIME BRICK CONVENTION IN CHICAGO.



National Association of
Manufacturers of Sand-Lime
Products

The third annual convention of the National Association of Manufacturers of Sand-Lime Products, consisted of three days session at the Palmer House in Chicago, December 5, 6 and 7.

The morning of December 5 was gloomy and murky and this weather condition prevailed throughout the three days of the convention. It was the kind which Chicago alone is capable of producing in the last few weeks that immediately precede Christmas when the thoroughfares of the great city are crowded with shoppers, and you don't have to wear roller skates to glide about on the side walk.

There was a good attendance despite the criticism with regard to the extent of the assessments levied at the last convention being widely bandied about, which goes to show that there is still a deep rooted interest in the Association effort by the manufacturers generally.

In the early part of the proceedings, this contentious spirit began to melt away and before the final adjournment was reached, the gentle dove of harmony would not have been frightened away.

There was an exhibit feature consisting of quite a collection of bricks made from various classifications of material, as well as some fine samples of building stone manufactured with sand and using lime for the binder. There was also one sample of a hollow cylinder which was perfect enough to be used for a porch column, or for a conduit, or the many purposes to which such a form would be best adapted.

From the papers and the discussions, it was clearly evidenced that the manufacturers of sand-lime brick have conquered the most of the difficulties which so sorely beset them a little over two years ago, when the decision was reached to form this association. These difficulties practically blocked the progress of the industry and prevented the plants from reaping a profit from their efforts. This unfavorable condition has been wiped out, and while every individual has done his full part to working out his own salvation, to this association must be given the credit of accomplishing great results in the way of disseminating useful and practical knowledge, which when applied and tested has proved to be beneficial and profitable to the participants in this associated

effort, as well as to others who have followed their course.

The sand-lime brick industry is to-day an established power and all of the plants are turning out a handsome and valuable building material, at a low cost of manufacture, and a selling price is being quoted now which is much below their actual value or what it should be when the quality of the goods is considered.

THE ATTENDANCE.

CANADA—A. Berg & Sons, Toronto, Anton Berg and John Berg; Indestructible Brick Co., Ltd., Toronto, Fred A. Clary; R. R. McArthur, Bradford.

COLORADO—Colorado Brick and Artificial Stone Co., Colorado Springs, Clark Meilen; Silicated Brick Co., Denver, A. E. Whetstone.

DELAWARE—Diamond Stone Brick Co., Wilmington, H. O. Duerr.

ILLINOIS—American Clay Machinery Co., Wheaton, C. C. Stoll; American Sand-Lime Brick Co., Chicago, John J. Moroney and H. S. Hopkins; Brick, Chicago, Harry de Jonnais; E. M. Castle, Joy; Clay Record, Chicago, Geo. H. Hartwell; A. F. Doyle, Chicago; Lincoln Sand and Gravel Co., Springfield, W. H. Butler; Main Belting Co., Chicago, E. P. Foster; National Brick Machinery Co., Chicago, P. L. Simpson and H. S. Simpson; Tri-City Sandstone Co., Moline, W. H. Crume; Rock Products, Chicago, B. F. McNulty.

INDIANA—American Sand-Lime Brick Co., Anderson, W. N. Durbin and W. C. Vanneman; T. A. Randall & Co., Indianapolis, T. A. Randall; Diamond Brick Co., Muncie, H. H. Wolfe; Laketon Sand Brick Co., Laketon, W. R. Oyler and Dr. Geo. L. Shoemaker; Indiana Sand-Lime Brick Co., North Judson, Jacob Keller and J. H. Shoup; Indianapolis Composite Brick Co., Indianapolis, Lawrence Elkins; Hydraulic Stone and Brick Co., West Bend, A. J. Pick; U. S. Brick Corporation, Michigan City, G. W. Bostwick and A. J. Lawrence; Ohlemacher Brick Co., Michigan City, A. Van Spanje.

IOWA—King's Crown Plaster Co., Cedar Rapids, William King and J. W. Pichner; Waterloo Brick Co., Waterloo, C. J. Miller.

KENTUCKY—Rock Products, Louisville, Fred K. Irvine.

MICHIGAN—American Sandstone Brick Machinery Co., Saginaw, Chas. B. Ebert; American Sandstone Brick Machinery Co., Saginaw, Thos. M. Jackson; Genesee Sand-Lime Brick Co., and Jackson Press Brick Co., Jackson, L. S. Anderson; Holland Brick Co., Holland, G. M. Straight and John Kerhoff; Menominee Brick Co., Menominee, Alfred A. Hines; Saginaw Sandstone Brick Co., Saginaw, John L. Jackson; The Saginaw Sandstone Brick Co., Saginaw, W. S. John C. Reinke; Sebewing Sandstone Brick Co., Sebewing, J. S. Palmer; Sibley Brick Co., Sibley, Geo. F. Ransom.

MINNESOTA—Red Wing Brick Co., Red Wing, John J. Bovy.

MISSISSIPPI—Aberdeen Sand-Lime Brick Co., Aberdeen, E. L. Young.

MISSOURI—Fernholts Brick Machinery Co., St. Louis, Wm. L. Rodgers; Illinois Supply and Construction Co., St. Louis, W. P. Grath; Ed. E. Squier & Co., St. Louis, Ed. E. Squier.

NEW YORK—American Clay Machinery Co., 39 Cortlandt St., New York City, R. C. Penfield; Buffalo Sandstone Brick Co., Buffalo, W. E. Plummer; The Paragon Plaster Co., Syracuse, W. K. Squier.

OHIO—American Clay Machinery Co., Wiloughby, L. W. Penfield and W. J. Carmichael; Board of Trade, Columbus, John J. Bassell and Ben. H. Harman; The Cleveland Brick Machinery Co., Wickliffe, J. H. Van Glahn; Granite Brick Co., Columbus, J. E. Robinson; P. B. Millholland Co., Marion, G. F. Carl, Receiver; The Pressed Brick Co., Dayton, J. F. Scott; Warsaw Sand-Lime Brick Co., Warsaw, J. F. Wagner.

PENNSYLVANIA—Altoona Pressed Brick Co., Altoona, S. B. Isenburg; Lehigh Car Wheel and Axle Works, Catasauque, S. U. Moyer; Spackman Engineering Co., Philadelphia, E. W. Lazell.

SOUTH DAKOTA—Sioux Falls Pressed Brick Co., Sioux Falls, A. J. Johnson, Ed. Johnson and T. H. Tucker.

TENNESSEE—Memphis Granite Co., Memphis, L. E. Jayner.

WISCONSIN—Janesville Granite Brick and Stone Co., Janesville, J. K. Jensen; Wisconsin Brick Co., Madison, H. A. Smythe.

In the very first session, there was a lengthy discussion over the expense the association had incurred by having the proceedings of the Detroit convention printed in book form. This question bobbed up frequently during all of the session, and just before adjournment, Rock Products made a proposition to print the full stenographic report serially in several consecutive numbers of the edition devoted to manufactured products which is dated upon the 22d of each month. A resolution providing for furnishing this paper, with a copy of the stenographic report and the papers read at the convention for this purpose, was unanimously carried, so that all of the members who preserve their files of Rock Products from month to month will soon accumulate the complete report just as if it was published in book form as before, and the full report will probably be completed as early as the pamphlet was finished after the Detroit convention.

In this issue, we give the proceedings of the first day's session, but regret that the stenographic report of the discussion could not be prepared in time to be given in full. However, the gaps have been well filled in from copious notes made at the two sessions, and absolutely no point that was mentioned has been overlooked. The future installments will contain the exact language of the members on the floor, as nearly as it is possible to obtain the same. This notice is given, so that all may be careful to preserve the copies containing the report, and all who require duplicates, will take this notice to place their orders early in order to be served.

MORNING SESSION, DECEMBER 5.

President W. K. Squier called the meeting to order at 11 o'clock, and after congratulating the delegates upon the number present, read his annual address, as follows:

PRESIDENT'S ADDRESS.

It is with a mingled feeling of pleasure and regret that I again call you to order and proceed to embody in a few words my greeting and my report, trusting the slight departure from the rule and precedent of our last convention will not be taken amiss as condensing the two into one and will enable you and me to more quickly dispose of the least interesting part of our program.

The pleasure of meeting you all is something I greatly appreciate, especially those who attended either or both our former assemblies, and I believe that what will be developed by our concerted efforts will amply repay every earnest worker in the sand-lime product field for not only maintaining a membership in this organization but also for attending our annual gatherings and that our common interest in this vocation will generate a bond of good fellowship that will be helpful.

It is also a pleasure to anticipate the handing of the gavel to my successor that new life and vigor may be infused into this body.

My regrets are many because of my shortcomings; what I intuitively felt a year ago has developed into the concrete, viz., that it would have been better if someone else had taken the reins at Detroit.

My offering to you to-day is so bare I am reminded of the two colored brothers who met and one said to the other, "Good mo'nin', Mr. Jonsin." "Mo'nin', Mr. Jirkins." "How you feelin', Mr. Jonsin?" "Oh, I feelin' all right." "Then what make you look so kinda solem-like?" "Mr. Jinkins, my trouble is family trouble. You see that woman of mine, she botherin' me, she naggin' me, she naggin' me every day." "What she naggin' you about?" "She all the while askin' for money. Yesterday mo'nin' she asked me for a dolla', this mo'nin' she wanted two dolla's, to-morrow mo'nin' she'll probly want two dolla's and a quarter." "My, my, Mr. Jonsin, what she do with all that money?" "I don't know, I never give her any."

My sins are those of omission rather than commission and I am disappointed that I have not been able to contribute to the general good or weave into the fabric of our work anything tangible. "But circumstances, that all-pervading atmosphere, wherein our spirits, like the unsteady lizard, take the tints that color, and the food that nurtures"—has made it impossible for me to do what I had hoped.

The cause of part of this is due to the reflex of last year's efforts and partly chargeable to you as a whole. To be explicit—the officers, especially our Secretary, during the year 1905 or since have not met with the ready response and co-operation and expenses incurred in endeavor-

ing to develop the scientific, as well as the practical side of this business, we anticipated when we made the slight draft on your individual coffers; consequently we were not warranted in incurring further obligations which would have followed if plans we had in mind could have been unfolded.

Someone accused me of being a radical. Well, I admit it, but probably my conception of a radical differs from his and my notion is best expressed by "Lents," who says, "What do we mean by radicals? We mean a man who pulls things up by the roots and examines them, shakes off the dirt and looks at them as they actually are, strips them of all the rubbish of superstition and the prejudice handed down from the Dark Ages; handed down from the time when men believed in alchemy and branded chemistry as heresy; handed down by the benighted brain that never saw nor dreamed of an electric light."

Do not understand me to presume to arrogate to myself virtue or importance here, but I have not hesitated and will not hesitate to call a spade a spade and to make the point I have in mind plain. I shall not refrain from criticizing any process or device that I believe faulty or unavailable because of fear of offending someone who may be engaged in exploiting some scheme or in selling systems, machinery or appliances and, for this reason, I was and am still of the opinion that the active members of this Association should be only manufacturers of sand-lime products.

A year ago I was convinced that the chemical end of this industry had been reached but the evolution of a year causes me to falter and I have some doubts as to whether there are not other elements that will eventually enter into the composition of the future sand-lime products. I am convinced also that what has proven true in clay products will inevitably follow in this art and that is, that to produce uniformly a more even product, greater care must be exercised in preparing materials in order to obtain the efficiency of the machines employed, especially the presses, and that much that is charged to faulty mechanism is due to the improper conditions under which machines work.

It is said, "Progress springs from doubt and until men are dissatisfied with the present order, there is nothing better for them in the future." So with us, we must have a high standard and maintain it if we are to be truly successful in this industry.

Reiterating what I said a year ago, I believe we are lacking in mechanical devices and that the American genius has not been aroused to our necessities or that we have not been long enough in the manufacturing field to attract the careful, practical investigator and inventor to supply us with mechanism that is well adapted to our conditions.

As to whether successful plants will in the future adopt the use of hydrated lime, dry sand, and dry mixing, and the combined ingredients receive the water or steam just before it goes to press, or whether fine ground fresh lime be mingled with a portion of sand, pulverized in tube or other type of mills, then combined with more sand, wetted, stored in a silo and, when seasoned, conveyed to the press, is an open question.

In a way, my company has been out of the main stream of progress. Unavoidable circumstances have necessitated the putting practically all of my energy into other branches of our business, but I am pleased to report that what attention our brick plant did receive was for the purpose of keeping it running to its full capacity while we were obliged to decline orders amounting to several million brick. This state of affairs has prevented my keeping in touch with the various successful plants and I am, to a large extent, unaware of what has been developed.

Already our ranks are thinned and some have dropped by the wayside. It would be most remarkable if this industry should not undergo a weeding process, especially when so many plants were unfortunately started and it is to be regretted that men, who never made enough sand-lime brick to build a decent morgue, were able to interest capital to exploit so-called systems by presenting figures to show that sand-lime brick could be made for \$3.00 and readily sold for from \$6.00 to \$10.00 per thousand. The seed was sown and brought forth fruit—dead sea fruit—disgusted, some have kissed their investment good-bye and turned their attention to other matters; some are hanging on, hoping—others stay because they can not let go; their all is at stake and they are fighting for an existence. A few, who never thought the manufacture of sand-lime

brick to be the royal road to fortune, are, so to speak, trudging up the hill believing by careful management an ordinary manufacturer's profit is obtainable and a successful business can be developed. These are they who will ultimately reach the goal and from them will evolve the process and devices best adapted to our wants. Is our situation different at this time from other infant industries? I contend that it is not and all who have the courage to stand by the ship and work consistently will eventually ride into port, gaining their reward. To the faint-hearted we say "good-bye;" to the stalwart "au revoir;" for surely we shall meet again.

Prices have been generally good but labor in most localities has been a difficult factor to contend with and I regret to say, oftentimes unreasonable and sometimes vicious and bad and the contention with this element has about balanced the favorable market.

It is gratifying to learn that Fritz Pohlman, Architect of the Minister of Public Works, of Germany, has, in the most emphatic terms, placed his seal of approval on our brick. He says, "The satisfactory experiments made with sand-lime brick have induced the administration of the State and cities to abandon their attitude which, for a long time, was unfavorable and to use this material in numerous public constructions." The certification of the Royal Technical and Mechanical Institute of Germany is all that can be desired. The standing obtained in other countries is worthy of notice, in Canada, Montreal, Toronto and other cities approve the brick.

Death's sickle has not passed us by but has cut down one of our number. Although I met Mr. Frank B. Bond but once and only a few letters passed between us, he impressed me as being a man of sterling character, one whose friendship was worth having.

While endeavoring to take a conservative view of our condition to-day, we can safely say we have proven our worth and must be reckoned with as manufacturers of a building material that has been tried and not found wanting. The prejudice we encountered is dying out. All who have maintained a reasonable standard will find it easier in the future to market their product and I am sure our progress from now on will be steady and satisfactory.

The interchange of ideas that will follow the reading of the papers is the natural and logical way of getting at the facts. The deduction each individual makes from the experience of others will lessen his trials and more quickly enable him to reach the promised land; therefore, let us be frank and admit our failures, explain any feature of this business we have been able to improve or ideas we are prepared to advance, and when our new president pronounces the benediction, I hope every person present will feel he has been amply repaid for the effort made to attend this meeting and will be anxious to be present at our next convention a year hence.

At the conclusion of his address, the President told a funny story about a hunter who could kill bears, foxes, and even moose, but couldn't kill time. He said he hoped this would be one of the conventions where there would be no time killed, for he regretted that there was a tendency to drag along at conventions.

H. O. Duerr, Secretary, then read his report, as follows:

SECRETARY'S ADDRESS.

We meet again after a year of successes and failures. From the general report received, I am glad to see that it has been principally successes; perhaps not the successes financially that we had hoped to realize or that we would have liked to have had. This feeling may be due in a large extent to the fact that a certain amount of dissatisfaction nearly always exists when we make a certain sum for we feel that more might possibly have been made.

I feel satisfied, however, that we have much to congratulate ourselves upon. First, by improving our product and our output, we are gradually forging ahead. Second, a fact perhaps even more important, we are overcoming rapidly the prejudices of the public, for daily we are gaining customers who only a short time ago would not even listen to us.

Sand-lime brick has come to this country, and has come to stay. Every day it is becoming a more important factor in the building world. A year ago I was constantly receiving letters for suggestions and help in the introduction of sand-

lime brick into new localities. These letters are becoming fewer, and I am, on the other hand, receiving more letters from various plants stating that they are full of orders and have been all the season. I know of several plants that have been so busy that they were not even able to accumulate stock during the winter season.

There have been a few failures, which are to be expected. There have been some discouragements, but they have been found also in all new industries.

Perhaps one of the greatest advances that has been made in the past two years since the organization of this association, is that of the improvement of the machinery. This is largely due to the energetic and sympathetic manner in which the machinery people have grasped the situation and have come to the rescue.

Still another important indication of development is that of the absence of the promoter. We hear less to-day of systems, patents, patentrights, etc., than we did two years ago, and I feel that the association has done much to protect the innocent public from being robbed. One or two concerns that were very prominent in this method of promoting plants and selling patentrights have met their deserved doom and have fallen by the wayside. The concerns that have been more conservative, more honest, have reaped the results of their work, and, I am glad to say, are still with us.

The association has not made the increase in membership which I would have liked to have seen. This may be due to a number of causes; one of them, and the principal one I believe, is a feeling that a mistake had been made in attempting secrecy.

At the meeting last year it was felt that the association had gone to considerable expense in obtaining information which was valuable to its members, and that in order to defray the expenses it would be necessary to assess the members an amount above the dues sufficient to pay for the work. After considerable discussion it was decided that if the proceedings were sent broadcast it would be difficult to raise this money as unfortunately many members would drop out and those who were not members would not see the necessity or desirability of becoming members if they secured all the information they wanted without paying for it. It was, therefore, decided not to publish the proceedings but to have them bound in book form and furnished only to those members who paid their dues and assessments. It now appears that in the minds of a great many of the members, as well as outsiders, this was a mistake. That secrecy has cast a sad, mysterious cloud over the industry, and has been detrimental to the industry.

Personally I can not agree with this view as I can not see wherein secrecy in the association, or its methods of producing the materials, should have any effect whatever upon the public that consumes the material. They are not interested in what we do in our association nor are they readers of the trade journals.

In order for the association to be of any benefit to its members, it must accomplish certain results for the members.

First. It must help its members to decide what are the best machines to be used in the manufacture of the brick.

Second. It must help its members to decide what are the best methods to be adopted in the making of the brick.

Third. It must help its members to decide what are the best methods to be adopted in placing those brick before the public and upon the market.

Many of us do not appreciate the value of science; therefore, we are not in sympathy with employing so-called experts to help out. None of us are so expert ourselves, however, but that we can not learn something from a scientist and we can not expect men who give their time and lives to the study of science to do this for the love of us. Therefore, it is necessary for the association to have money to make investigations and to employ assistance. In order that we may have all these things, the members of the association must expect to contribute cheerfully and plentifully, for it is at this stage of the industry, when we are in the midst of development, that we need the most assistance.

In a few years from now, when everything is running smoothly and we are all able to smile, we may not need an association for any other purpose than to meet and congratulate one another and help spend the profits by taking a few days off.

I am not in sympathy with the man who came to the meeting last year and voted for the assessment and took up a lot of the time by asking numerous questions and was given a great deal of information, which he acknowledged to me personally was invaluable to him, and when I sent him a bill for his dues and assessment, he at first ignored the bill and afterwards wrote me that he did not see the necessity of belonging to the association, that it was not worth the money to him.

If we are willing and ready to stand together and help one another and are willing to contribute our pro rata share of the expenses, (these expenses need not be more than we are ready and willing to vote that they should be), then I am heartily in favor of publicity of every nature and kind.

On the other hand, if it is expected that three or four should stand all the expenses and the others should reap the benefits, then I am decidedly opposed to publicity.

The report of the work accomplished by the secretary is brief and I think you will readily see the cause.

It was desired to make up a printed list of all the towns giving the number of buildings and brick used, and distribute this list among the members; so that when the architects and builders asked, "Where are these bricks being used?" you could give them one of these lists.

I sent to each member a request to give me a list of the number of buildings in which their bricks had been used, the names of the towns, and the approximate number of bricks used. To this letter I received about six answers. So that project had to be abandoned.

Then when I wrote to all members stating that if they would send me a fair sample of their bricks and sample of material which they were using in making the bricks, and tell me exactly the methods they used in the manufacture, the materials would be examined and analyzed and the bricks tested and from this table would be made up a statement which would indicate what material and what method produced the best results.

This was all to be done without expense to the members or to the association, except the trouble it would put them to in order to collect these materials, box them up, and the expense of the expressage. (Dr. Lazell had volunteered to do this work free of expense to the association.) I received samples from so few, and some of these were sent "Collect," that it was useless to attempt to get any information which would be of much value.

All this would indicate that either you are satisfied with the results you are obtaining, or else you have no interest in the work that the association is trying to accomplish.

I am a firm believer in the fact that we can not do much good if we do not attempt to carry out such ideas; it is just possible, however, that merely to meet once a year in a social way and talk over things in general, will be the more successful way of conducting the association. In the latter event there will be little or no expense connected with the association. It would be decidedly easier for the officers of the association as last year's meeting was voted an extremely strenuous one and many of us were thoroughly exhausted from our efforts.

The program committee this year decided to have fewer papers and leave the time open for more discussion, more social intercourse. I would, therefore, suggest that if the program does not touch upon some points which the members would like to have discussed, that they call our attention to it in order that a time can be arranged for discussing such matters as have been omitted from the program.

At the conclusion of his paper, by request of Treasurer King, Mr. Duerr read the Treasurer's report showing total collections of \$1,896.61; total expenditures of \$1,848.62, leaving a balance of \$47.99, with outstanding bills of \$486; cash on hand, \$205.00. The chief items of expense consisted of the following:

Printing and supplies	\$209.89
1,000 copies proceedings Detroit convention	667.00
Tests conducted for benefit of association	615.65
Stenographer's bill	274.96
Expenses, Secretary at Detroit	104.00
Expenses, Secretary at New York	38.00

The Secretary reported that there were still 900 copies of the proceedings of the Detroit con-

vention, containing the account of Prof. I. H. Woolson's report of the comparative tests as conducted at Columbia University Testing Station, and also Dr. E. W. Lazell's instructive talk upon the structure of the sand-lime brick. The secretary asked the sense of the meeting with regard to the disposition of these books.

A long discussion followed, in which Messrs. Anderson, Duerr, Penfield, De Jonnals and Palmer participated, and it was finally decided upon a suggestion of Mr. De Jonnals to sell the books to technical libraries for \$5.00 a copy, and to members in such quantities as they might desire at \$1.00 a copy.

The secretary was further instructed to have printed an index to be inserted in the books, and to show to parties who might be induced to purchase them.

Mr. Palmer moved that a membership committee be appointed to investigate the records and to report the names of active members of this association, as only those who have paid the \$30.00 assessment, were entitled to membership. The president appointed on this committee Messrs. Palmer, Mellen and Bovy.

By suggestion of Mr. Penfield, the pamphlet on sand-lime brick that was issued shortly after the first convention at Cincinnati by Secretary Duerr, was commended as being one of the best documents for promoting the use of sand-lime brick that had ever been published, and after a brief discussion, 2,000 copies of this book with such slight alteration as might suggest themselves in a revisionary way, was ordered to be printed.

The convention then adjourned until 2 P. M.

AFTERNOON SESSION, DECEMBER 5.

The president called the meeting to order promptly at two o'clock despite the fact that the members were somewhat tardy in arriving, because he is a man who believes in getting things started after they are undertaken. For the guidance of the association, the full text of the Constitution and By-Laws was read so that all could know the rules under which the meeting was being conducted.

The President then called upon Mr. Penfield to read the paper of Mr. James F. Hobart, who was absent. The paper follows:

SILLO METHOD OF MANUFACTURING SAND-LIME BRICKS.

BY JAMES F. HOBART, M. E.

The sillo system of manufacturing sand-lime bricks, is the mixing of sand and lime in the proper proportion, then allowing the two materials to remain in contact with each other, in a bin or sillo, for a length of time which warrants the complete hydration of any lime particles which may have passed the mixing machinery and still remain in the unhydrated, or "raw" state. When unhydrated lime in lumps of any size, gets into the hardening cylinder, then the bricks will be "swelled," "bulged," or even broken by the swelling of the lime particles in the hardening cylinder.

By allowing the mixed material to remain in a moistened condition for a period ranging from four to forty-eight hours, all the lime will become hydrated, and swelled bricks will be unknown. This system is applicable to all methods of making sand-lime bricks, either from raw, or from hydrated lime, though the so-called "dry system" employed when commercial hydrated lime is used, must be modified somewhat in order to use the sillo method of handling mixed material.

When the straight "dry method" is used, the lime and sand are brought together in the proper proportions, and passed through the necessary mixers, from which the material is carried directly to a finishing mixer which delivers to the press. The water necessary for the proper working of the material in the press, is all added in the finishing mixer. The process being entirely without water up to this point, hence the name which is characteristic of the method.

When a proper hydrated lime can be obtained, very good bricks are made by this method, but there must be no unhydrated particles in it, and no particles of lime which will not pass through a grading screen or sieve of 100 meshes to the linear inch. Failing in either condition, troubles of many kinds await the brick-maker. When there are lumps of unhydrated lime, the bricks burst, and "daddy's bean patch" is reproduced in miniature on every brick containing a bit of lime near the surface of the brick, in the condition named. When unhydrated, but very finely pul-

verized lime is worked into the bricks by the dry process, or by the wet process, either, for that matter, the bricks will swell, uniformly in each of the three dimensions and in several instances in the experience of the writer, the bricks have thus "expanded" to the extent that it was possible to pull the car from underneath the bricks, which remained suspended in the upper portion of the hardening cylinder.

The bricks thus "expanded" proved rather soft, but in some instances, where the hydration was quickly finished, and before much hardening had taken place, the bricks were fairly good, though over size in each dimension. In other cases, where the lime had not received as much hydration, previous to being pressed in mixture, the bricks were torn to pieces by the internal pressure of the expanding lime, and the only remedies found, were to either reject the slow hydrating portions of the lime, or, to adopt the silo method, and allow the mixture to remain in a moistened condition from 24 to 48 hours as the lime might require.

Some limes hydrate very slowly, others combine with water very readily. When the slow limes are used by passing the lime through a hydrator, the quick hydrating portions are at once united with water, while the slower portions of the lime pass through the hydrator in lumps. The mere act of being tumbled through the hydrator, causes the lumps of anhydrous lime to break up to a considerable extent, and small fragments of lime are broken off the larger pieces by the tube-mill action of the hydrator, pass into the hydrate through the screen, and find their way into the bricks, only to hydrate in the hardening cylinder, and burst some of the bricks.

When the above is the case, the only resource, if the slow hydrating lime must be used, is to have recourse to the silo system, or method, and wet the mixture as soon after mixing as possible, and then allow the mixture to remain in storage until the slow lime shall have completely hydrated—usually from 24 to 48 hours, as noted elsewhere. When hydrated lime must be treated thus, in order to hydrate the slow portion of the lime, it is only sensible to dispense with the previous hydrating and grind up the lime without first hydrating a portion, then pass through the mixer and permit all the hydrating to be done in the silo, instead of a small portion, as with the previous hydrating noted above.

Work of Calcium Silicate.

When lime is first hydrated, and then mixed with the sand, there is beyond doubt a considerable loss of hardness in the brick made from the hydrated lime. The sand-lime brick is really an artificial stone and is hardened by the formation of calcium silicate between the particles of sand composing the brick. Calcium silicate is formed by a chemical union between the lime and the silica in the sand, which action is accelerated by the presence of steam and heat. Both these are evolved during the hydration of the lime, therefore, what more reasonable to expect than a better brick can be made when the hydration of the lime is accomplished in contact with the sand, and the steam and heat act directly against the sand, instead of being lost in the atmosphere, as is the case when the lime is previously hydrated. The bricks made from lime mixed with the sand and then hydrated, have a smaller absorption than the bricks made from pre-hydrated lime. The bricks are also harder, and less lime is required to obtain the same results, when previous hydration is dispensed with and the lime is used "raw."

It is virtually necessary, in making sand-lime brick by any "system," or "method," that the lime be first reduced to an impalpable powder, and then coated over the entire surface of every particle of sand. The means employed to obtain this, are not arbitrarily fixed. Any method which produces results, may be employed, but it is essential that the lime particles be made fine enough to pass a screen of 100 meshes to the lineal inch, and if the particles all passed readily through a screen or sieve of 200 meshes to the inch, better results would be obtained.

As stated the means employed for reducing the lime to this degree of fineness, matter not, and a tube-mill, or a dry pan, or any other method may be employed as desired. It becomes evident, that no more lime should be used than will thoroughly coat each and every particle of sand. In fact, should more than this quantity of lime be used the strength of the brick is not increased thereby, and the unnecessary lime does no good, even if

it is not really a source of weakness in the brick.

By using the wet, or silo method, the handling of the lime—when hydrated lime can not be obtained—is much simplified. All that is necessary, is to run the lime through a crusher, then to the proportioning machine. When, however, the lime must be hydrated before being mixed with the sand, then trouble roosts in the sand-lime factory and a horrible mess is the sure portion of the sand-lime brick man. When a crusher is used, the lime should be brought into the factory only about as fast as needed, and crushed and used immediately. In fact, it is the ideal method to take from air-tight storage each day, only as much lime as will be needed in the factory that day, crush that amount of lime, and mix it with sand immediately, wetting the mixture as soon as it is mixed—in transit, in fact—and then running the wetted mixture direct to the storage bins for the completion of the hydrating process.

Experience has demonstrated that a Williams mill is about the best lime crusher that can be obtained. This hammer machine fitted with a feeder breaker, will handle all the lime necessary. A No. 1 machine proving ample for a factory making 40,000 bricks each day of twenty-four hours; nine working hours. A factory thus handling lime can be made dustless—something utterly impossible when lime is hydrated on the premises and then made into bricks.

For the purpose of storing the wetted mixture of sand and lime, all manner of receptacles have been constructed and used. The plain square bin is the earliest form of silo. The material fell into one of these bins from an elevator or conveyor, usually so placed that in order to fill the storage place, a great deal of the mixture had to be shoveled over, the elevator discharge not being high enough to permit the bin filling more than one-half or two-thirds full. Circular bins have also been used with indifferent results, the great trouble being that it is hard to get the material out of a circular receptacle with a conical bottom, on account of the tendency of the material to lodge or clog in the cone shaped bottom of the bin.

The best form of storage bin, is the long V-shaped receptacle constructed with slides at the bottom for egress of the material, and a belt conveyor the entire length of the bin, upon which the material falls as it comes through the slides. The calculations and sketches of the first of the V-shaped bins ever built, were made by the writer while riding on a train between Washington and New York, and from drawings made by the writer, these bins were constructed at Glen's Falls and Fort Edward, New York, and in at least thirty other factories in the United States—and yet one or two parties claim to hold patents on these bins. Perhaps they do. Such a patent don't hurt the storage bins any, and a man might get out a patent on the moon if he should apply for one!

The writer has recently designed and installed V-shaped bins without the central dividing partition, and finds the elimination of the partition to be a great improvement. Instead of allowing material to fill one side of the bin while the other side is being emptied to the press, the overhead conveyor is so arranged with a hand-tripper that the material is dumped into one end of the storage bin while the seasoned material is being drawn from the other end of the bin to supply the press. Thus, it is only necessary to have the bin long enough, to be able to store the mixture one or two days as may be found necessary.

The mixer employed, has a great deal to do with the quality of bricks turned out by the silo method—or by any other method as well. As yet, no form of mixer has been found which will do the work of the tube-mill or dry pan, and for making face bricks, one or the other should be employed. The tube-mill, properly constructed, is far preferable to the dry pan, although good work is done with the latter. The tube-mill is preferable for the reason that it is a continuous performance, and with the silo method, it is desirable that the mixing be kept as even and continuous as possible.

Returning again to the mixer:—The writer has found it desirable to use a single mixer, and prefers this type to the double shaft, two-speed machine which is so valuable in mixing clay. Sand-lime, however, is an entirely different proposition, and clay machines and methods frequently have to be radically modified in order to give satisfaction in handling a mixture of sand and lime. The mixer blades should be quite long. A length of 12 inches from center of shaft to end of blade,

is desirable, and the distance may be increased to advantage if a great amount of work is to be done with a single mixer, with four double blades to the foot.

For one or two four-mold presses, the 12 inch blade will supply ample material, and will provide ample and even mixing. The speed of a mixer of this type, with 12 inch blades, may be from 50 to 70 revolutions a minute. In fact, it is the practice of the writer to run these mixers as fast as the gears can be made to run safely. At a high speed, with the long blade, the material is thrown from one blade to another in the upper portion of the mixer, thus securing an entire freedom from lumps caused by balling or rolling, as is frequently the case with double mixers. A mixer with 12 inch blades, and with 10 feet of blade covered shaft, is a very good size and may be used as a dry mixer for the first five feet, the water pipe extending across the mixer in the middle of its length, the wet mixing portion being also five feet in length. Of course these proportions may be varied in case of need, the dry mixing being extended or diminished by merely moving the water pipe, while the wet mixing is varied in an opposite direction from the change in the dry mixing. That is, the more wet mixing length of machine, the less dry mixing, and contrawise.

Dustless Sand-Lime Brick Factory.

It has for several years been the desire of the writer to erect a dustless sand-lime brick factory. A factory recently erected at Boise, Idaho, by the writer, for The Intermountain Building Material Co., through the American Clay Machinery Co., of Willoughby, Ohio, is practically dustless, and this excellent quality is largely owing to the construction of the tube-mill discharge and feed. The mill is one of the Schmidt type, with a discharge hood fitted by the American Clay Machinery Co., which prevents entirely the egress of dust at the discharge end of the mill.

A specially designed mixer, of the 24 inch type described above, was built underneath the circular discharge hood, and made dust-tight thereto. The elevator from mixer to bin was built for the first eight feet of height, in the form of a room, the mixer passing along in the floor of the room and the elevator chains and buckets ascending in one corner. Neither the mixer or the elevator was enclosed except by the small room mentioned, which is possibly six feet by eight feet in size. From the ceiling of the room, the conventional elevator legs ascend to the upper portion of the factory, enclosing the chain and buckets in the usual manner. In this way, a large number of the usual elevator troubles are dispensed with. It is easy to get at the foot wheel of the elevator, and if the machine should become clogged, it is easy to shovel out the surplus material without having to work in restricted quarters as is the case when the ordinary elevator gets stopped up. There is no dust whatever, from an elevator closed in this manner, and as the material is all wetted thoroughly as it issues from the tube-mill, there is no chance for dust there.

The silo method is particularly easy to make dustless as the material is wetted as soon as possible, and handled entirely in a moist condition to the point where it goes to the press. It is the aim of the silo process man to add exactly the amount of water necessary, as the mixture issues from the tube mill, so that the material will be neither too wet or too dry when ready for pressing after the time of storage for complete hydration, has passed. Considerable skill is required to do this, also an intimate knowledge of the amount of water the lime will absorb and how much will dry out during the period of complete hydration. It requires a little practical experience to determine this point, then the operator seldom finds it necessary to add water to the mixer over the press. Neither does he find the material coming too wet, but just right for the making of first class bricks.

It is one of the advantages of the silo and wet methods, that there can be a considerable variation in the amount of water added to the mixture, from time to time, and still have the mixture come to the press very even and correctly moistened. An explanation of this seemingly paradoxical statement is found in the peculiar manner in which the material is taken from the silo when it is to be pressed. With the V-shaped storage bin in particular, the material is put into the bin in cone-shaped layers, but when the material is withdrawn for pressing, it comes out in

sections taken at right angles to the conical layers. That is, the material comes out in a mixture of the thin sections or layers, so if there be strata of too wet material, or too dry stuff, the delivery cuts right through both wet and dry, and, mixing them, the resulting material is neither too wet or too dry, and is in the best possible condition for making first-class bricks.

On the other hand, when material is mixed by the "dry" process, it is very difficult to wet the mixture evenly and as it goes direct to the press, there is no opportunity for the moisture to spread and equalize the wetness, hence the frequent delivery to the press of material too wet or too dry, to the great disgust of the press men and to the damage of the finished bricks. When material varies in moisture, it is necessary to vary the depth of the press molds accordingly, for, the wetter the material, the more space the loose material must have in the molds, and, contrawise, the dryer the material, the more the lower pressure plates must be raised in order to prevent too much material from entering the molds, thereby causing the bricks to "sandwich" and come out utterly worthless. When the material varies in moisture so greatly as to become apparent in the color of the pressed bricks, the hand wheel of the press must be kept moving with great frequency and the quality of the bricks is sure to suffer for the reason that the dryer the material, the better the bricks, the less absorption, and the greater crushing strength. It is not possible to make as good a brick from wet as from dry material, and the moisture should always be kept as low as will allow the bricks to be taken from the press and piled upon the cars. Material which has stood over night with the proper amount of moisture, invariably goes to the press in better condition than is possible with freshly wetted material.

The writer has found from personal experience, that the silo system or method produces better bricks wherever it is used, even when a perfectly hydrated lime is used. Where the lime is only partially or incompletely hydrated, the silo method is a necessity, and where raw lime is used, the silo system produces the best sand-lime bricks made. The following examples from actual practice, point to the silo method as one possessing many advantages and few if any bad points:

Advantages of Silo Method.

1. A factory equipped with a tube-mill, had no storage bins and hydrated the lime in cars placed in the hardening cylinder beneath the brick cars. The hydrate was mixed with the sand and passed without having been screened, into the tube-mill, thence direct to the press, water being added over the press immediately before pressing the material. The lime was not ground, or screened in any way, but was passed direct from the measuring machine into the tube-mill, thence to the press, being wetted just before the mixture passed to the press.

The resulting bricks were far from satisfactory, the bricks being quite soft and lacking in hardness and water-resisting qualities. A silo was made to the factory equipment, and the mixture allowed to remain in storage after being wetted, for 24 hours. The result was that the bricks came out much harder, possessed greater crushing strength and absorbed less water. It was probable that the lime was not completely hydrated when the bricks went to the cylinder, before the silo was installed, and this being the case, the hydrated process swelled the lime, thus making the bricks slightly larger and more porous. Consequently the material was forced apart slightly by the swelling of the lime and the porosity of the bricks increased enough to make them appear softer after the curing process was finished.

The installation of a silo, allowed the lime to hydrate perfectly before the mixture went to the press, thus preventing the swelling of the bricks, to the detriment of the qualities of hardness and porosity. The addition of water immediately after the mixture left the tube-mill, permitted a much more uniform mixture of water and the resulting material was smoother, freer from lumps, and more uniform than ever before and the quality of the bricks was enhanced accordingly.

2. A factory was equipped with a Frieze mixer, an American hydrator and a supplementary mixer or "Agitator" for a final dressing of the material just before it went to the press. A very large silo was also included in the equipment of this factory, but the management had an idea

that the silo was a useless piece of apparatus and tried the experiment of running the material direct from the mixer to the press. The results were not at all satisfactory. In fact, the bricks were worthless.

It was necessary to use a very soft chalky lime and the perforations in the hydrator screen had to be increased to $\frac{1}{4}$ inch in width in order to get the required amount of lime through the hydrator. Necessarily many bits of hydrated lime passed through the screen and went through the mixer in which machine the lumps received the necessary amount of water for hydration. The period of storage in the silo enabled good bricks to be made, as far as hardness was concerned, but lime spots still remained, there being no way of pulverizing the lime lumps after they were mixed with the sand—there being neither drypan or tube-mill in this factory. The silo obviated all bursting of bricks, or "popping" as it is often called, but it could not rid the bricks of the lime spots. An air separator and a hammer mill was finally installed for finishing the lime after it has passed the hydrator. The silo system proved the salvation of this factory, for another plant nearby, was equipped with the same lime hydrating and handling processes, but without the silo. This factory never turned out as hard bricks as the one which was equipped with the silo.

3. A factory which was equipped with a hydrating machine and a tube-mill, had provision for adding water only at the point of delivery of the material into the press hopper. The lime proved very slow hydrating, frequently requiring from 24 to 48 hours for complete hydration.

The hydrating machine passed small fragments of caustic or partially hydrated lime through its screen and these particles were ground very fine in the tube-mill, but when wetted in the mixer above the press, proved capable of expansion in the bricks, and "pops," while not pronounced on account of the fine grinding of the lime in the tube-mill, took the form of raised portions in the surface of the bricks and in many instances, caused a regular and pronounced increase in the size of the bricks which were enlarged in every dimension. This action not only caused the regular enlargement of the bricks above mentioned, but it also caused a universal disintegration of the brick which resulted in a softening of the entire body of pressed material through the movement apart of the sand particles, caused by the expansion of the fine lime particles.

The addition of a mixer at the tube-mill discharge, and a storage bin or silo for the mixed and wetted material, where the mixture could be stored from 24 to 48 hours, proved a complete remedy for the very slow lime which had to be handled in this plant. It was subsequently found that by eliminating the hydrating machine, crushing the lime in a hammer machine, and proceeding otherwise as with the hydrate, that a better and stronger brick could be made than when the hydrate, or partial hydrate was used. A Williams hammer pulverizer, with a breaker-feeder attachment, proved all that was necessary for preparing the lime for the tube-mill.

Mr. Plummer: What is the difficulty of getting the material out of the silo? Does it cake hard and have to be chopped off? If so, what is necessary to overcome this objection?

Mr. Mellen: We use hydrated lime mixed with sand in our silo. It is very sticky. It takes a man all of his time to keep the lime punched down. When we are using caustic lime, we find that it is not so sticky; so we consider that it altogether depends upon the character of the lime. I favor the silo, and have found that the best results come from using pulverized caustic lime.

Mr. Anderson: I have tried both the silo system and the hydrate mixer, and think everybody will have to work out their own equation with their own special material. I have found some considerable advantages in tempering the lime for several days before using. I am now operating a plant at Jackson, Mich., and we are using a silo. We get our lime from Mitchell, Ind., and it is first crushed with a Jeffrey hammer mill, and then hydrated in the silo.

Mr. Isenburg: I have only had experience with the silo and will say that I am a silo man. I find the expense to be \$1.50 a day using a V-shaped silo with a division in it. On one occasion our lime was left in the silo for sixty hours, and we found no difficulty in getting it out. My plant is located at Altoona, Pa. We grind the sand very

fine and are well satisfied with the product we are getting out. Our silo is 25 feet long and 14 feet high, with a door at the bottom for the operator to enter to scrape it clean.

Mr. Penfield: I think I understand Mr. Hobart's system. He depends upon a man getting it out of the silo and on the conveyor but I can not see how a man inside of the silo can tell whether he is feeding the conveyor too fast or too slow.

Mr. Isenburg: We have never had any trouble of that kind.

Mr. Bovy: We are using the same kind of a silo and find that it requires a man to punch it down.

Mr. Ransom: What per cent of lime does the gentleman from Pennsylvania use?

Mr. Isenburg: $7\frac{1}{2}$ per cent is what we have found to be about the proper thing.

Mr. Duerr: Has anybody tried using only a part of the material in the silo and then mixing more sand with the silo mixture before molding the brick?

Mr. Bovy: We grind the sand and lime all together.

Mr. Mellen: We have three openings in our silo and find that the best proposition.

Mr. Carmichael: Mr. Mellen's silos are smaller in body than that just mentioned and deeper.

Mr. Duerr: I don't think it is necessary to put all of the material into the silo. Why not grind a part of your sand with all of the lime, put water with this afterward and then mix with the balance of the coarse sand?

Mr. Carmichael: If all the lime and all the sand are mixed together with water and put in the silo, will it not whitewash the sand kernels?

Mr. Duerr: I have examined the contents of silos made by both processes and will say that they seem to be just alike even by microscopic examination.

Mr. Ransom: I have made experiments in this line in a small way and found that there is a bonding in the material, part at least; then has to be broken up, which afterwards acts at an inert body in the mass. Lime hydrate will take up carbon dioxide and in that way it makes heat.

Mr. Duerr: I don't think the carbonation amounts to much.

Mr. Anderson: I believe that steam is necessary for making the quality of hydrate necessary for brick making purposes.

Dr. Lazell: It really doesn't make any difference which process is employed, because the coarse sand is only the filler or aggregate, the fine sand in conjunction with the lime as the binding material. It takes considerable time to make the "butter" of lime.

Mr. Simpson: It is impossible to use magnesian lime in a silo. It has been tried over and over again and failed. There must be some other method where dolomite lime is to be used.

Mr. Penfield: One system will not do in all cases. There must be a distinct system for each different set of materials.

Mr. Anderson: At our Jackson plant we tried twenty different kinds of lime and only found one that would make the quality of brick wanted. This lime we are now getting from the Mitchell Lime Co.

Mr. Isenburg: We are using Centre county, Pennsylvania, lime which is 99 per cent calcium. On one occasion when we were unable to get this lime, we secured a supply from another kiln at Tyrone, Pa., which is said to be from 18 to 28 per cent magnesia, and noted absolutely no difference in the silo. A fine opera house was built in our city of Altoona of our sand-lime brick and shortly after completion, it was burned out, without the slightest injury to the structural qualities of the brick. In fact the building was reconstructed by the use of the same walls.

Mr. Duerr: I have found that the physical nature of the lime has as much to do with the case as its chemical constituents.

Mr. Hopkins: No dolomite lime can be hydrated except by the use of steam.

Dr. Lazell: As I said at the convention last year, there is no rule that will work in every case where the materials themselves have such a wide variable nature. Every man must work out his formula by practical experience.

Mr. Simpson: One of the difficulties of using lime for any purpose is its unreliable qualities. There is no accuracy about the burning of lime.

Mr. Oyler: We find that the wetter we get our brick, the better they are.

Mr. Ransom: I have noticed a limit in this regard in both directions.

In the absence of Mr. Lippincott, of Philadelphia, Mr. Meilen, by request of the president, read his paper entitled "Lime," but before proceeding to read the paper, he read a communication from Mr. Lippincott which enclosed a report taken from an old Geological Survey of the State of New Jersey. The letter and report follow:

LIME.

BY HORACE MATHER LIPPINCOTT.

I shall have to ask your indulgence in presenting this paper upon Lime. It is the most important material subject to be treated in our industry and I therefore approached it with awe after considerable hesitation in accepting the very kind invitation to do so which was made to me at the last moment on account of the disappointment of a more worthy exponent. I can speak only from the manufacturers' point of view and not from the burners' or chemists'. As Dr. Lazell said last year that there was about 90 per cent of the chemistry we didn't understand I do not feel, however, that I am too heavily handicapped on that score. My experience has been confined to one specific system, differing quite a little from that in use with most of you, and my knowledge of other methods is not intimate.

It goes without saying that good lime is a necessity to the manufacturer of good sand-lime brick. In a region where good limestone does not exist or where the methods of burning are crude, manufacturers should adopt every means that are now known to use their lime so that it will achieve as near as possible the results of a good uniform high calcium lime. It will be found a false economy to buy a cheap low grade lime or to use little care in its use. The resultant loss either actually in finished bricks or in their quality will be more than it would cost for care in these matters.

The selection of the stone is of course the first thing to do in choosing your lime. The theoretically pure limestones are composed entirely of calcium carbonate. The limestones we have to deal with in practice depart more or less widely from this theoretical composition, either in the presence of magnesia in place of part of the lime, or in the presence of impurities, such as silica, iron, alumina or alkalis.

The lime resulting from the burning of a pure limestone is a white solid and should be in lumps, the occurrence of powder or dust proving that the lime has been exposed to the air so much since burning that air-slaking has begun.

If the raw material is impure the burned lime will not be white, but will vary from yellow to gray or brown according to the amount and kind of impurities present.

Too much importance can not be given to the burning of the limestone, and it will be well after the manufacturer of sand-lime bricks has satisfied himself with the quarry to also look into the methods of burning. As in other departments of our business what we want is uniformity. We must be able to depend upon this, and while it is well to have samples from every car of lime received, analyzed, yet we wish to know when we order a shipment made that it is going to be just the same good stuff we have been using right along. If a pure limestone, or calcium carbonate, is heated to 800 degrees C, or over the carbonate is disassociated, the carbon dioxide being driven off as a gas, while the calcium oxide is left behind as a white solid, known as quicklime. As the driving off of the carbon dioxide is hindered by its own presence the gas should be removed as fast as it is formed, or a jet of water introduced which makes a mixture of steam and carbon dioxide that exerts less pressure than the gas alone. This latter method is the common practice. The lime should be thoroughly burned so as to have no unburned core, but it is just as important to not over-burn it for the carbon dioxide then returns and a carbonate is again formed similar to the original limestone. In both these extremes of burning the lime would be very slow to hydrate.

Of the various methods of burning the old-fashioned "pot-kilns" are probably the simplest and the worst. Circular and tapering at top and bottom they are generally over 25 feet high and 10 feet in greatest diameter. In charging, the largest pieces of limestone are first selected and formed into a rough, dome-like arch with large, open joints springing from the bottom of the kiln to a height of five or six feet. Sometimes there are alternate layers of limestone and fuel, and often the fire is simply built under the whole mass and the heat gradually raised and maintained for several days until the end of the burning when all is removed from the bottom. If there happened

to be a strong northeast wind one side of the kiln is burned and the other side not, the stone nearest the dome arch is liable to become injured by over-burning before the top portions of the charge are thoroughly calcined. The loss of heat at each burning is enormous for the quantity of fuel necessary to raise the contents of the kiln and the walls to the necessary degree of heat has to be repeated each time the kiln is charged.

If alternate layers of fuel and limestone is the method the burned lime is discolored by contact with the fuel, the ashes can not readily separate from the burned lime, thus lowering the quality of the product, and a part of the fuel ashes may clinker on the outside of the lumps of lime, preventing even and satisfactory burning. You can readily see how uncertain and unsatisfactory this method of lime burning is for our uses.

The modern method of burning and the one which will give us the results we can depend upon is that in which separate fireplaces are used to carry the fuel, distinct from the body of the kiln. They may be either set in the wall of the kiln or outside the kiln-shell. The limestone thus does not come in contact with the fuel but only with the hot fuel gases and long flames. It is also quite clear that in this way the firing can be kept under better control, so that the percentage of over-burned material in the product is materially decreased and we get nearest to uniformity. The drawing of the properly burned lime is controlled absolutely by the operator.

Now as to high calcium or magnesia limes. It is obvious that the former should be used in manufacturing sand-lime brick whenever procurable. High calcium limes slake rapidly and evolve much heat during the slaking. Magnesian limes slake very slowly and evolve very little heat during the process. It is also necessary to use a larger percentage of this lime.

We all know that perfect hydration is necessary to produce a uniform hard brick, and that particles of unhydrated lime will crack and often disrupt the brick in the hardening cylinder. Even if the bricks survived the steam treatment and still had particles of unslacked lime within them, which I do not believe possible, contact with the carbonic acid gas of the air would in time cause a carbonate to be formed which would greatly diminish the resistance of the stone. It is also true that while calcium silicate is being formed, a simultaneous formation of carbonate of lime may take place if the lime is exposed to the carbonic acid gas contained in the air and this carbonate is easily attacked by the atmospheric agents. It is therefore well to prevent the hydrate from coming into contact with the air. It is advisable with all limes and necessary with magnesia limes to hydrate with as much heat as possible. In our plant and by our system we hydrate our lime in 20 minutes and we have not only to get the purest and most uniform high calcium lime obtainable but we have to use every possible means to accelerate hydration. This we do by first grinding the lime to a very fine powder and then slaking it in an air tight steam jacketed chamber by means of steam and hot water injected therein. The mixing with the sand is done at the same time. The raising of the temperature in this way thus accomplishes three things—it quickens hydration, insures absolute slaking, and is a large factor in causing the chemical action to begin at once, the lime seizing hold of each particle and beginning then to form active silica so that the bricks sustain much better the accelerating action of steam under high pressure.

When slaked lime is mixed with the sand the lime does not appear to act until you put it in the cylinder and thus the hardening is begun more suddenly. I think it is admitted that the chemical action, that is the seizing on of each particle of sand by the lime, begins to some extent when the lime is hydrated in connection with the sand and therefore no matter in what way this is done it would seem unwise to allow any great amount of time to elapse before making the mixture into bricks and putting them into the hardening cylinders, because if there is the least tendency of the particles to stick together this setting of the mixture or constant chemical re-action would be destroyed or arrested in the process of re-mixing and pressing.

The amount of water used in hydration will vary according to the character of the lime and every manufacturer will have to decide how much water is necessary to produce this hydrate. If it is a pure high-calcium lime more water is added than if it contains any considerable amount of magnesia or impurities. I have been in three plants where pre-hydrated lime was used and although they were very careful in their methods of

manufacture, particularly with the preparation of their sand they did not make a hard brick. In each case I went over the various stages of their manufacture and concluded it was in the matter of lime that they were deficient, not in quality, for that seemed to be good, but in that they did not seem to consider the points I have just tried to make clear.

We have used a number of limes from West Virginia, Maryland, Virginia and various parts of Pennsylvania. They varied from 91.50 per cent calcium oxide to 98 per cent in quality, and in price from \$4.00 to \$5.60 per ton. We have used from 6 to 10 per cent in the mixture and found that this depended not only on the quality of the lime but on amount of fine sand.

So we should try to get a good high-calcium lime, properly burned and use it with reason and care. Unless all our materials and conditions are fixed and uniform it is impossible to lay down any definite invariable rules, but we must depend upon the human element and the exercise of these two qualities—reason and care.

G. W. COOK IN SECOND ANNUAL REPORT OF THE GEOLOGICAL SURVEY OF STATE OF NEW JERSEY FOR THE YEAR 1885 (pp. 107-108.)

GRAVEL BRICKS.—A new building material has been introduced in Cumberland and some of the adjoining counties, which promises to be both cheap and durable. The common, clean gravel and coarse sand of the country is mixed with one-twelfth its measure of stone, lime and made into bricks.

These bricks are sun-dried and then laid up into walls. They are cheap, durable and but little affected by the changes of the seasons.

In making, the gravel is laid on a common mortar bed and the lime, which is slaked and made into a thin putty in a lime trough is then run on the gravel and the whole worked up into a mortar. The bricks are usually made as large as is convenient for handling and of dimensions to suit the work for which they are intended. The molds are made, several in the same frame, as deep as the thickness of the brick and without any bottom; they are set on smooth ground and filled with mortar. This is worked in a little with the shovel and struck off at the top. In ten or fifteen minutes the mortar will have set, so that the molds can be taken off. The bricks are soon dry enough to handle when they can be piled up and allowed to dry thoroughly. They are laid in mortar, similar to that from which the bricks are made and the outside of the buildings are rough cast with the same.

Several buildings of this kind have been erected in Bridgeton and its vicinity within the last eight or ten years, and in Norristown, Pa., it has been in use for seventeen years past. It has stood well, growing harder and more solid every year. The bricks have come to be a regular article of manufacture in several places. Those of 12x9x6 in. were selling in Bridgeton last summer for \$20.00 a thousand, and they could be laid and mortar found for \$10.00 a 1,000, which is less than half the cost of same measure of red brick walls. The material of which these bricks are made being found almost everywhere, and the labor of making and laying them up being very simple, farmers and others who have control of labor can make and lay them at times when the expense of the work would not be felt, and thus saving much greater than that mentioned could be made. When first laid up they are not quite as strong as other bricks, and greater care is necessary in making a solid foundation, otherwise unequal settling and cracks in the walls will result. Care must be taken to make them so early in the season as to be entirely dry before the winter's frost.

This establishes the fact that the sand-lime brick industry has been known near Philadelphia since 1838.

Mr. Carmichael: A man told me not long ago that one of the best brick ever made was manufactured by the use of air-slaked lime.

Mr. Plummer: We made 150,000 brick of air slaked lime and were indeed surprised by all of them coming out in very good condition.

In the absence of Robert F. Wentz, Mr. Bovy, by request of the president read his paper:

CAN SLAG BE USED TO ADVANTAGE IN MAKING BRICK?

BY ROBERT F. WENTZ, M. W. S. E.

The utilization of waste or the manufacture of by-products is a subject of great interest and is receiving much attention in all branches of the industrial world. Much has already been done, but more remains to be done.

The subject assigned me, however, is not to

treat on the utilization of slag (which is a waste of vast quantity in the smelting of iron) but whether slag can be used to advantage in making brick.

In order to induce the most thorough investigation and inspire the greatest confidence in the utilization of slag for making this common building material, I will but briefly refer to what has already been, and is now being done in the use of slag for the manufacture of one of the leading, if not the leading, building material of the 20th century, viz., that of cement.

Slag-cement is made by intimately mixing granulated blast-furnace slag of proper composition with slacked lime, and reducing the mixture to a fine powder. This product, though usually called Portland cement by the manufacturers, is not true Portland, and has certain qualities which prevent its use for all purposes for which a Portland cement may be used, though it is a good enough material for many purposes.

The production of slag cement in the United States for 1905 was 382,447 barrels, valued at \$272,614.00.

The manufacture of brick furnace slag is not altogether new.

About two years ago the author made a tour of investigation and research in Europe and spent some time with Mr. E. R. Sutcliffe, of the engineering firm of Sutcliffe & Speakman, Leigh, England, who has given much study and investigation to the utilization of slag, having made many experiments himself, in his own works, as well as other works. He is a noted engineer and authority on this particular subject, and to him I am indebted for some of the data and statistics given in this paper.

In France, Belgium, Germany and England great strides have already been made in utilizing slag for the manufacture of brick, paving blocks and artificial stone.

In the Meurthe-et-Moselle district of France there are seven iron works where granulated slag bricks are made, producing a total of between 24 and 25 million brick per annum.

In the Grand Duchy of Luxemburg there is one factory where 3,000,000 granulated slag bricks are made per annum, the product of which equals, and in some particulars surpasses any shale or clay brick. The various works erected for utilizing slag have demonstrated that paving and building brick of an excellent character can be made from it.

The building brick made from slag up to a few years ago, and, to some extent at the present time, are principally made from granulated slag; the method adopted being to intimately mix with the granulated slag passing a No. 10 or 12 mesh screen, from 6 to 10 per cent of slag cement, hydraulic lime or Portland cement. This mixture is then moulded into bricks under a pressure of from 50 to 100 tons per brick. They are then stacked in the open air, where they remain for about three months to harden. This method is one chiefly adopted in France, Belgium and Germany. The brick made by this method are somewhat porous in character (the porosity is due principally to the coarseness of the material used), but is of excellent quality, well adapted for foundation work, but more particularly for liners and partition walls.

In England the method used for making slag brick is similar to that used for making sand-lime bricks, and the product is called, "indurated slag brick." The brick produced by this method are hard, dense, and will stand any test that a good sand-lime, or hard-burned clay or shale brick will stand.

The method and machinery required to make slag brick depends upon the physical characteristics and chemical constituents of the slag to be used.

Some slag, more particularly these containing from 38 to 50 per cent of lime, do not require the addition of fresh lime because they already possess the cementitious qualities required; such slags, when ground fine and made into bricks under great pressure, will set on mere exposure to the atmosphere. By subjecting the bricks to the action of the steam, however, they not only become harder, but the hardening is effected very rapidly.

The steam pressure required to give best results depends upon the composition of the slag. To determine what pressure is most suitable is a question of experiment with the particular slag to be used. With some slag low pressure is quite as effectual as high pressure; some slag would go all to pieces under high pressure, whereas low pressure would produce a hard brick. The writer has not formed a definite opinion, as to what element

in the slag causes the different effect, in the action of the high and of the low pressure steam, but is inclined to think that it is principally due to the proportion of sulphur in it. During the steaming some sulphur is driven out or combined. It is probable that the sulphide of calcium present is slowly being split up; the hydrogen of the water combining with the sulphur forming sulphuretted hydrogen, and the oxygen with the calcium forming lime.

Generally slags high in sulphur can be hardened under prolonged low pressure steam, with better results than with high pressure for a short period; in some instances no hardening effect can be produced by high pressure steam, whereas low pressure steam produces the desired effect. From this it would seem that the chemical action is only accelerated up to a certain temperature, and that at a higher temperature a different effect is produced, or it may be at a higher temperature the action is too violent, causing an expansion and separation of the particles without actually producing cracks or disintegration of the brick, but sufficient to prevent the final combination. Seemingly the presence of this unfixed sulphur retards the action of the lime on the silicates and aluminates, and only when it is finally driven off can the full combination be effected.

The slag used for brick making should preferably be new; but it has been found that a slag which had been exposed for twenty years still possessed setting properties when acted upon by steam.

In the case of a slag which disintegrates on exposure to the atmosphere, it would not be wise to use it directly after it had cooled, unless the ground and moistened slag is permitted to stand until the free lime is thoroughly hydrated.

As pointed out above most of the silty slags have setting properties without being steamed; and with such slag, containing from 40 to 48 per cent of lime bricks can be made by merely grinding and pressing the material and permitting the bricks to stand out in the open air, the same conditions being observed as in making granulated slag brick, but this method is not as satisfactory as the hardening by steam. In slags there is a proportion of soluble salts which tend to spoil the bricks when allowed to harden naturally by appearing as efflorescence, this in some cases is so violent that the outer crust will be forced away from the brick; but the same effect does not happen when they are steamed, the steaming either turning the salts into a stable compound or driving them off.

Slag brick made by the sand-lime brick method will withstand the weather equally with a high grade clay or shale brick. There is no reason why a brick made from slag as described should not have a great future before it. In strength it is much above a sand-lime brick; it is cheaper, and only in color it is inferior.

The table below gives crushing strength of slag brick and is taken from the Journal of The West of Scotland Iron and Steel Institute.

CRUSHING STRENGTH.				
No. of Specimens	Dimensions	Crushed at Tons Per Sq. Ft.	Remarks	
1.	9x4½x2	375	Not completely crushed	
1.	9x4½x2	375	Not completely crushed	
1.	9x4½x2	370	Not completely crushed	
2.	9x4½x2½	375	Not completely crushed	
2.	9x4½x2½	375	Not completely crushed	
2.	9x4½x2½	375	Not completely crushed	

ABSORPTION TEST.				
Sample No.	Size	Weight Before Immersion	Weight After Immersion	Gain in Weight
1.	9x3½x2½	8 lbs. 10 oz. 9	10 lbs. 1 oz. 7	5.07
2.	9x4½x2½	8 lbs. 12 oz. 9	10 lbs. 4 oz. 8	5.71

The bricks before testing were thoroughly dried at 212 degrees, and then immersed for 24 hours.

Most all slags contain sufficient lime without the addition of new lime, and where this is the case brick can be made at a very low cost, and eliminating the most difficult problem connected with the manufacture of indurated products or sand-lime brick, namely the hydration of the lime.

The writer has also had experience in making brick from coal ashes or cinders from boilers.

Several fair samples are on exhibition, made of different proportions of lime, sand and ashes.

In the opinion of the author blast-furnace slag and coal ashes can be utilized for brick-making to good advantage.

On motion of Mr. Mellen, the president appointed a nominating committee of five to nominate officers for the ensuing year, the personnel of

which would be mentioned later in the meeting. The meeting, on motion, adjourned to Thursday morning. Rock Products for January 22 will resume the report with the morning session of Thursday December 6.

NOTES.

On the last day of the convention at Chicago, the following officers were elected for the ensuing year:

President—H. O. Duerr.
Vice-President—Clark Mellen.
Treasurer—William King.
Secretary—Harry de Jonna's.
Executive Committee—John L. Jackson, Geo. W. Bostwick, and W. J. Carmichael.

The Allegheny Facing Brick and Concrete Co., Standards, New York, inform us that they intend to erect one of the most complete sand-lime brick plants in the United States. W. S. Calhoun is the general manager and his post office address is Genesee, Pa.

James Robinson, general manager of the Granite Brick Co., Columbus, O., tells us of the completion of a large shed over the brick yard at their plant. Other improvements are contemplated in the near future.

The Aberdeen Sand-Lime Brick Co., at Aberdeen, Miss., have held their annual stockholders' meeting and declared a five per cent dividend. The establishment has been doing business for seventeen months, and shows a net profit of 25 per cent upon the capital invested.

The Moscow Sand and Gravel Co., of Scranton, Pa., intend to erect a sand-lime brick plant in the near future. Carl Lorenz and E. Schimpff are the principal stockholders of the concern.

The Steger Canadian Sand-Lime Brick Co., Vancouver, B. C., has been organized with \$100,000.00 capital stock and they intend to build an immense sand-lime brick manufacturing plant. The solicitor for the company is J. A. Russell.

The last day at the convention at Chicago, J. Y. Bassell, and Ben. H. Harman, of Columbus, O., invited the association to hold its next convention in that city, and after a ringing speech by Mr. Bassell, the delegates voted unanimously to hold the next convention at Columbus, O.

Good Advice.

When the blue-sky artist was telling his Munchausen tales it was never over \$4.00 cost in manufacturing sand-lime brick, including all the materials and a little blue-sky in addition, but in our travels recently we met an operator. Owing to the close proximity of his good bank sand which is sharp and excellently adapted to the manufacture of sand-lime brick and the fact that it cost him less than 3 cents to put this sand into the mixer from the bank, his lime is manufactured very economically because of natural conditions, and he was able to make brick for \$3.57 per thousand, 20 per cent of which is for wear and tear. There is no reason why a man should figure on that basis. Suppose in 1906 he was able to do this owing to the fact that he had some good men with him who were so much interested in the proposition that they carried more than an ordinary amount of work, but we found this gentleman with his low cost, made possible because he was only paying 65 cents for fuel oil, was not figuring on that basis at all. He said: "We grade our bricks face brick, No. 2 and No. 3, and we get a large percentage of face brick out of them and do not put them in competition with \$7.00 common brick which, by the way, in our section are very bad, not only because of the material, but the mix and making is not up to date, but it is only our cull brick that we put in competition with this material and we are still of the opinion that we should base our figures on this basis and if we can make good profit out of the business that is our business. We are spending our money to get the best machinery to be had. We are giving our best time and effort. We have selected our location after much consideration and because we have been lucky in our location and in selecting our materials there is no reason why we should give them away to the customer. We believe in having an incentive in life and get the best price possible for your manufactured product."

For the Retailer.

The National Builders' Supply Association.

Meets Semi-Annually.

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Official Organ, ROCK PRODUCTS.

National Supply Men's Convention.

The Eighth Annual Meeting of the National Builders' Supply Association, will be held at Columbus, Ohio, February 6, 7 and 8, 1907. The headquarters of the association will be at the Great Southern Hotel, on South High Street, and there all the official sessions of the convention will be held. Let every member and those intending to become members make their arrangements to be there.

The January issue of ROCK PRODUCTS will give the fullest and minutest details, both as to the program, the arrangements of the various local entertainment committees and the prospectus of the convention.

Don't fail to see January ROCK PRODUCTS, and we will meet you at Columbus.

The Retailers' Meetings.

Colorado and Wyoming Lumber Dealers' Association, Denver, Col., January 8-9-10.

Indiana Retail Lumber Dealers' Association, Indianapolis, January 10-11.

Northwestern Retail Lumber Dealers' Association, Minneapolis, January 15-16-17.

Nebraska Lumber Dealers' Association, Lincoln, Nebraska, January 22-23-24.

Union Association Lumber Dealers of Ohio, Cincinnati, January 22-23.

Southwestern Lumbermen's Association, Kansas City, Mo., January 29-30-31.

Kentucky Retail Lumber Dealers' Association, Louisville, Ky., February 5-6.

Michigan Retail Lumber Dealers' Association, Detroit, February.

Mason Material Dealers' Association of New Jersey, Newark, March 14.

Illinois Masons' Supply Association, Lexington Hotel, Chicago, February 12-13-14.

The Closing of an Active Year

Dealers in builders supplies have experienced a twelve-month of activity. The demand has been in many sections greater than the supply of the material at hand, due to at times to scarcity of material; but the trade has suffered more from scarcity of cars than anything else. The open fall made it possible, except of course in the Northern States, to complete the buildings in course of construction, and hence almost up to Christmas the building supply man has had his hands full.

During the holiday period when most of us are trying to make our inventory and place data in the hands of the book-keeper that he may present figures on which to base our profits or losses for the year, the lessons learned from the transaction of the year will then crop out. It is our belief that the particular lesson that will impress itself on the dealer is that he has not been enough of a specialist, although, in certain cases, some dealers have an over-production in brands handled, because many of them have been left on the shelf. It is our opinion that to handle too many lines is worse than having not enough, and, if we could all conduct our business on an equitable basis, which would insure satisfaction to the manufacturer whose goods we handle, as well as please our customer by furnishing him what he wants and when



STANLEY RHOADS, CHAIRMAN ENTERTAINMENT COMMITTEE COLUMBUS CONVENTION.

he wants it, we will not be discouraged over what the trial balance will say. It is always necessary, however, to have these figures, for no matter how active the man at the head of the business is where a large volume of business is done, he is likely to overlook one branch which he may think has been well established and should take care of itself, or the executive part of the business may be all he can handle, and he may entirely overlook the details.

Of course, we are proud of the fact that the building supply men are as an aggressive lot as you will see in any line of trade. Especially is this true in many of the larger cities; but he has his busy time, for the head of a building supply concern must be a diplomat, and an aggressive business man as well as a credit man, unless he can afford to hire a man for these departments in addition to his regular sales force, and the man who has charge of getting the goods out and delivering them on the ground.

The C. E. Morgan Co., of Ravenna, Ohio, probably carry as large a stock and do as much business, considering the size of the town as any supply company in the State. A great deal of the material handled by this firm comes from the Cleveland Builders' Supply Co., of Cleveland. They report satisfactory results from the Atlas and Iriquois cement, as well as the U. S. Gypsum Co.'s plaster. The sewer pipe business seems to be increasing and Mr. Morgan thinks the American Sewer Pipe Co.'s product good enough. The prospects for spring are bright, as a great deal of building will be started by that time.

"ON THE ROAD."

I. G. Tolerton & Son, Alliance, Ohio, leading dealers in building supplies, report that they have had the most successful year in the history of their establishment, and still the outlook for the continuation of building operations seems to be good. They state that they expect to be represented at the Columbus convention, for they are up-to-date dealers and believe in the association principle.

While in Youngstown, Ohio, recently, a ROCK PRODUCTS' man dropped into the office of the Youngstown Ice Co. There we found our friend E. J. Holloway full of business, although the pressure in the line of building supplies is now reduced to a great extent. He said that they have had the greatest year in the history of the company and that right now the coal business is the main feature of their operation, for they handle coal in the winter time upon an extensive scale, just as they handle building material of every description during the building season.

Mr. Koehler, the man who works outside, is down with the typhoid fever and Ed Walton, the general manager of the concern, had been sick for over a week, threatened with typhoid fever. Mr. Walton remarked that there seemed to be no limit to the growth for the demand for Portland cement, that they had sold between 150,000 and 160,000 barrels of the Atlas brand.

The ROCK PRODUCTS' man met J. O. Freeman the other day, who has for some years been connected with the sewer pipe business and now at New Windsor, Ill. Although the plant is located at Griffin Switch on the C. B. & Q. road, they will shortly be favored with a new kiln, the Rock Island agreeing to put in a switch. Mr. Freeman is general manager of the Northwestern Clay Manufacturing Co. that makes sewer pipe, flue lining, wall coping and large drain tile, having the clay, shale and coal all in the same hole in the ground and within easy reach. They will add a new engine and boiler, one wet and one dry pan and a press, and thus double their capacity. The many friends of Mr. Freeman will be pleased to know that the first year's business has been an active one and orders plentiful.

Heard in the Smoker.

The smoking room of a Pullman car is to the newspaper man what the jam pantry of his mother was when he was a small boy, for you may meet the gambler and the tout with a bank president, but you will often find somebody in your line whom you never met before. This was the case the other night when we shook hands with James Monohan, of Monohan Bros., plaster contractors in Chicago. Mr. Monohan has had various experiences in this line and is doing some of the best jobs in the country to-day, one of his present ones being the new million dollar addition to the Seelbach Hotel in Louisville. Speaking about the business Mr. Monohan said: "One of our troubles comes when we have fifty or sixty men on the upper story and paying them \$5.00 for eight hours' work, to get the material on the ground and see that it goes in the wall. We find that good workmen who are really interested in making a success for themselves and their bosses are rather hard to find, but we are fortunate in having some of that kind of men. The business is not the easiest one in the world, as you probably know, but we have discovered that in construction there is a better class of plastering being done, owing to the fact that people want the best materials, and we try to take the highest grade of plaster finish manufactured by the United States Gypsum Co., as well as their agents in all the principal towns, and give the contractor and thus the proprietor, the best job that care in the selection of material and placing it on the wall will insure. We have had a busy season and it looks like we will lap over into next year with the number of jobs on hand."

The estate of R. J. Saltman, which has been carrying on a builders' supply business at Erie, Pa., has incorporated under the name and title of Saltman Coal and Supply Co.

Preparing for Big Convention.

COLUMBUS, OHIO, December 19.—As the time approaches for the National Builders' Supply Dealers' Convention, the members located all over the country naturally want to know what is going on here. The local association of supply dealers, of which Frank Hunter, general manager of the Cleveland Contractors' Supply Co., is president and Stanley Rhoads, of the Columbus branch of the American Sewer Pipe Co., is the secretary, and of which all of the dealers located at Columbus are members, held a meeting recently at which Secretary Harry S. West, of Toledo, and Richard Kind, of the Toledo Builders' Supply Co., who is chairman of the National Board of Directors, were present.

It was the sense of the meeting that the entertainment features of the convention, which is to be held February 6, 7 and 8, 1907, with headquarters at the Southern Hotel, be left to a local committee. The meeting was quite enthusiastic in character and every concern operating in building supply lines, was represented either in person or by proxy.

Stanley Rhoads was elected chairman of the local entertainment committee and all of the members became ex officio parties to the committee. Besides these, it has been deemed advisable to invite the representatives of several Columbus interests intimately associated with the builders' supply business, such as manufacturers of brick, machinery, etc. There could have been no better choice for the chairmanship of this committee, for Mr. Rhoads is a hustling business man of the type, which has made the city of Columbus in recent years, such an important commercial center. When he has something to do he tackles it with a hearty good will, and he never gets tired until the last final detail is finished in the most approved manner. This means that the work is all divided out among the members of the committee, and even man realizes that he must do his part.

The entertainment committee has already had a meeting where a tentative program has been under careful consideration. Mr. Rhoads is in personal touch with his entire committee and you may depend upon it that every arrangement will be made for the comfort and convenience, as well as the enjoyment of the convention occasion. The committee has even gone so far as to have the theatrical managers of the city make arrangements for securing the very highest grade attractions at the various playhouses.

The Governor of the State of Ohio, the Mayor of Columbus and the Board of Trade have all pledged their assistance, and the ground work of preparation upon a large scale, has been well and properly made. Chairman Rhoads says: "We are providing for 1,200 to 1,500 visitors, and we can raise the ante and get ready for 2,000 total attendance if necessary. There is no limit to the accommodations to be had in Columbus, for the people here are accustomed to taking care of large gatherings. We hope that the members will bring their wives with them, for we intend to have a special program of amusements for the ladies in attendance at this convention, during the hours that the dealers will be in attendance upon the sessions of the convention.

"The hospitable gates of this old town will be thrown wide open to the builders' supply dealers



OFFICE, WAREHOUSE AND YARDS OF E. M. BALTES & CO., FORT WAYNE, IND.

and there is a hearty welcome waiting for every one who comes."

The general Columbus committee upon the organization of the local entertainment feature is composed of the following gentlemen: R. Stanley Rhoads, American Sewer Pipe Co., chairman; Frank Hunter, Columbus Contractors' Supply Co.; C. H. Doan, Nelsonville Sewer Pipe Co.; J. P. Carille and T. T. Swearingen, of the South Side Lumber Co.

A committee has been appointed which the local dealers laughingly call "The Ladies Committee," because nearly all the members are unmarried gentlemen and it is their duty especially to look after the entertainment features for the ladies who attend the convention. The committee consists of C. H. Frank, Ernest Woolenweber, Warren B. Ferris and T. T. Swearingen. Several other committees will be developed and put to work as the arrangements progress and the needs develop.

The hotel accommodations of the city of Columbus are unsurpassed. The Southern Hotel is a fine, modern fire-proof hotel building, sumptuously furnished and large enough to accommodate several hundred visitors. Besides this, there are a number of other well equipped hotels in Columbus, and the total accommodations from this standpoint will be ample for even 10,000 visitors. So that with the largest estimates which run from 1,600 to 2,000, there is no doubt of everybody being able to get first class accommodations. The hotels have made an agreement with the local entertainment committee to charge the regular rates during this occasion, but it would be well for the members, especially those who anticipate bringing their wives with them, to make reservations at the Southern Hotel of the rooms they will require in plenty of time, for the indications are, that there will be a large attendance.

It has been a most successful year for every man engaged in the supply business, and there is an inclination to use the National Association Convention as a gala occasion, as well as to line up the business engagements for the coming year. Every interested dealer should make it a point to attend the Columbus convention, for the indications now point to a continuation of the prosperous conditions of the country for another year at least, and this means building operations upon even a larger scale than we have ever known up to this time.

It is only the man who plans his business campaign in advance, who comes out at the end of the year with the right kind of a balance on his ledger. What's the use of pushing business and using capital the whole year round, and not realize all out of it that should come. That's what's the trouble with the dealers who are so blind as to stay outside of the National Association.

tion. They make a little money and that's enough for a little man, but the big men inside of the National Builders' Supply Association pick the grapes in large bunches because they know how.

A Fort Wayne Visit.

FORT WAYNE, IND., December 8.—When the representative of Rock Products called at the E. M. Baltes & Co.'s place of business, recently located at Fort Wayne, Ind., at first glance it looked as though the good fairy had been at work with her mystic wand. Everything is new and as near perfection as the original brain of Mr. Theo. Schwer could conceive. The main building is 100 feet long by 36 feet wide, two stories high. The outer office or general reception room is finished in oak with a brick dado five feet high around the entire room. The office fixtures are of oak and would do any bank credit. Just to the left of the ante office is Mr. Baltes' private office, and this leads into the office proper. The bookkeeper, and stenographer are located as well as the office of Mr. Schwer and Mr. E. M. Baltes. A fire proof vault stands just back of this office, with burglar proof safe in it. The building has a platform on either side about three feet from the ground and four feet high. The main wareroom is located just back of the office which opens on to this platform from either side. This is not only convenient but it has another virtue, the fact that a door on either side makes it possible to put the cement in the center, causing a circulation that keeps the product perfectly dry.

The yards are conveniently arranged, and the lime and sand bins are built of first quality lumber air tight. The barn stands just back of the yard, and money has not been spared in this department. The floors are of concrete and the floors in the stalls are made of creosoted block.

Saylor & Bronson cement is handled by this enterprising firm as well as Huntington lime and American Sewer Pipe Co.'s sewer pipe.

William Mollering & Sons have one of the oldest business houses in Fort Wayne, and they are a progressive building supply concern. They handle a complete stock and keep up with the times by putting in the newly introduced materials, such as metal lath, plaster board, wall ties, insulated partition block, beside the regular line of cement lime, sewer pipe and structural tile. This firm issues a complete catalogue of the line carried by them, printed with illustrations in an attractive way to show the customer just what they have in stock ready to ship. By this means they have built up quite a considerable jobbing business in the territory tributary to Fort Wayne. This point is an important railroad center with transportation facilities second to none of the greater cities. Mollering & Sons have been members of the National Builders' Supply Association from the time of its organization, now almost eight years old, and they say that they will certainly be represented at the coming Columbus convention.

A. J. Clementz, the leading builders' supply man of Massillon, Ohio, reports business as being satisfactory. One of the many jobs they are furnishing material for at present is the new opera-house. About two carloads of lime and one of cement will be used to complete the building. Whitehall cement and United States Gypsum Co. plaster are being used exclusively by this firm.



SOUTHERN HOTEL, COLUMBUS, OHIO.

Sand and Gravel.

Increased Knowledge of Sand.

The sand industry in the year 1906 is one of those which have experienced an extraordinary development. Previous to the great awakening in the concrete industry, about the only use for sand was for the making of mortar in conjunction with lime and cement for the laying of brick and for mixing with lime and gypsum for the manufacture of wall plaster. Very few people in any given community knew anything about the sand supply of their own locality, and the dealer in builders' supplies was usually called upon to furnish the sand along with other building material for the accommodation of contractors, and for the most part little was thought of sand operations as a profit making proposition, for the supply man either secured it from a nearby pit or mine, or had it gathered from some convenient stream, or when catering to larger communities resorted to the centrifugal pump for the purpose of providing such quantities as would take care of such larger demands. All the ideas have passed away, and now the producing and supplying of sand has come to be one of the most important industries at every large trade center.

Millions of dollars are now invested in sand operations and it is handled with almost as much care as the precious metal itself, and in fact the sand operations of the United States in 1906 amount to almost twice as much as the world's production of gold from every source. The sands from the pit from the bottom of the river, from the bed of the lake and from the margin of the ocean are now being carefully studied by experts with university diplomas, and men who have devoted their lives to scientific research. All of the varieties and sizes of sand are being carefully classified and compared, and the amount of knowledge that has been developed upon this subject in a single year almost constitutes a distinct subjective literature. Only two years ago practically all that was considered worth saying upon the subject of sand could have been printed in a small pamphlet of sixteen pages; in fact, that is the size of the United States Government Sand Report, published in the year 1904. To-day, the positive classifications, discussions and research upon the subject of sand could not be contained between the covers of a standard unabridged dictionary.

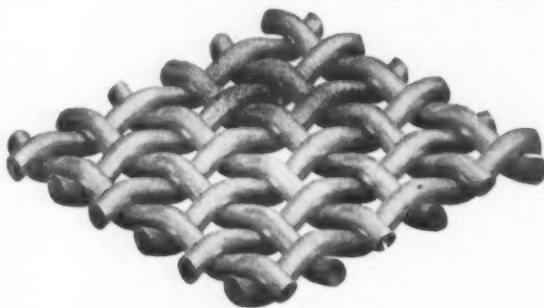
The sources from which sand is derived have been discovered, and it has been developed that it is one of the most variable materials in existence, as found in nature, although lavishly distributed in some quality in almost every locality.

It is amusing to look over the sand specifications made by the best engineers only a few years

ago, and note the difference in similar specifications made by the same men at the present time. There are some old fogies who are still specifying the ancient phrase, "Clean, sharp, coarse sand," with as much solemnity as if such a description had any real meaning in this enlightened day. Such fellows are not to be blamed; it is the way they learned to make specifications twenty-five or thirty years ago when they were at the technical school or in the drafting room of some practical master of those days. They have not acquired anything for themselves and so continue along the old lines. They do not realize that they can specify precisely what they require for the specific purpose for which the sand is to be used, and they have not learned that sand can be sharp, coarse and clean, and still have little or no value in a mortar or a plaster, while for concrete purposes if it should happen to be all coarse it would be well nigh worthless.

A feature that has been developed this year is the manufacture of pure sand by the grinding of sand stone in a specially constructed crushing and pulverizing plant built for that purpose. The crusher dust of hard flinty limestones has also been found to be extremely useful as a sand proposition, especially adaptable for use in the facing mixture for all kinds of concrete works, while the crusher dust that comes from establishments engaged in breaking up waste granite has been found to be one of the most valuable sands that has ever been marketed. The demand for manufactured sand of extremely high grade is practically unlimited, such a small fraction has been supplied in comparison with what would have been readily taken that there is no telling how much really could have been used. There will certainly be a large number of sand manufacturing plants erected in localities where the material can be cheaply had. This is another branch of industry being developed as a new product of the rock that will be better known as it grows larger.

The handling of natural sand has been developed



TYLER SAND-SEPARATING SCREEN.

so that screening and sifting devices are now separating the sand from the gravel and dividing both of these into several sizes, according to the mesh of the screens used. It is found to be more scientific and positive to use sands and gravels of various known sizes than to take the mass as provided by nature and depend upon luck to make the proper mixture of various dimensions. All of this improvement has naturally tended to the increase of the price of sand, but where the sand is properly rehandled by shifting and separating devices it is found to be well worth the difference in price, for it secures economy which was unexpected and unknown before the real knowledge of the sand itself became known. It is found that a proper proportion of several sizes of sand and gravel will secure a wholesome economy in the binding element of plasters and concrete mixtures. Perhaps the end is not yet and it may be that a year from now there will be a large development in our knowledge of sand to be recorded, but certainly 1906 has been the banner year for the dissemination of knowledge and an appreciation of the qualities and varying characteristics of sand.

Sand-Separating Screens.

The W. S. Tyler Co., Cleveland, Ohio, announce upon another page that they are prepared to furnish all manner of wire screens and screening cloth for the use of the sand plant. Their separating screens are in use in many of the successful new concerns who have begun to make money out of modern sand operations. The separation of gravel in two or three distinct sizes and the division of sand into as many sizes while it is being washed at the same time by flooding the screens with water, is an operation that is becoming familiar in every locality where high class concrete building materials are being manufactured. Speaking of the business they say: "We now consider that no concrete manufacturing concern can claim a complete equipment who have not installed an automatic sifting and separating device to handle the sand which is to be used in the manufacture of concrete commodities."

Unique Gravel Plant.

Near Newcomerstown, O., Messrs. Shoemaker & Casparis operate a unique sand and gravel plant. Their separator is built upon a platform car so that it can be moved to any desired locality, but when working in their great gravel pit two parallel tracks are laid right into the sand pit itself. The railroad company furnishing the cars deposits them upon the track which is connected with the railroad and the sand elevator and separator is moved along from car to car, only pausing long enough beside each car to load it, then passing on to the next. It is an ingenious device produced by the members of the firm and installed by them to facilitate their own operations. A good illustration of the mechanism of this machine is shown on this page. It is claimed that this machine is quite economical in view of the enormous capacity of work which it turns out regularly. The record of the machine has shown fifteen hundred tons daily, and it is customary in practice to load ten cars in four hours. Shoemaker & Casparis are not only extensive operators in sand and gravel at Newcomerstown, but are also extensively engaged in the business of quarrying and crushing rock at several good quarries, at locations within a short distance from Columbus, Ohio.

The Big Four railroad's gravel pit near Terre Haute, Ind., will be enlarged to give a capacity of eighty cars per day. The larger part of the gravel will be used on the double tracking between that city and Indianapolis.

ROOFING.

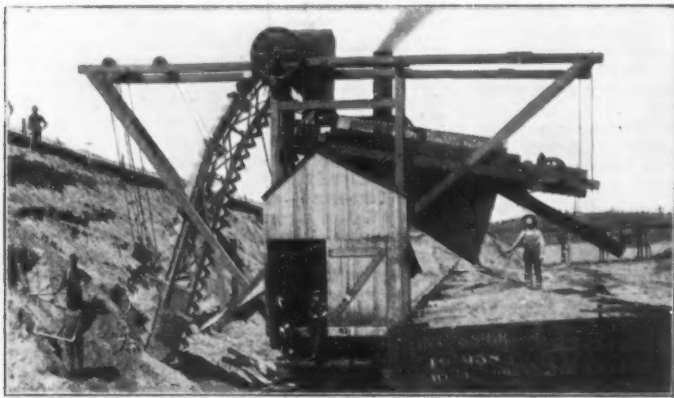
A New Cement Shingle.

There are several different styles of cement roofing in the market, but frequently it has been said that there has been something lacking. The complaint has been either that the roof leaked, or that the shingles were too heavy or were not of the proper shape to give the house an artistic finish. The Diamond Cement Machine Co., of Deshler, Ohio, has produced a shingle that is said to combine all the good points of other shingles and to obviate the bad points. The roof, when finished with these shingles, give the building a rich appearance, which seems lacking with some other roofs of this material. The shingle is made in the shape of a diamond and really looks like four shingles. Every shingle locks in the one above it, making it impossible for the snow or rain to be driven under. They are fastened with nails just the same as tiles, and the roof can be laid in any close place, for the reason that there is nothing to fasten from the inside.

The machine upon which they are made is a model in itself and any ordinary workman can operate it. The best feature about the whole proposition is that the machine is within the reach of all.

Will Increase Capacity.

The General Roofing Manufacturing Co., of East St. Louis, Ill., announces that its capital stock will shortly be increased to \$650,000.00. Contracts have been let for additions to the roofing plant and for the erection of a mill adjoining to manufacture saturating felts. The extensions will cost \$200,000.00, and will give a capacity of three times the present output. This company uses large quantities of asphalt, talc, sand and gravel in surfacing their ready roofings.



GRAVEL SEPARATOR AT PLANT OF SHOEMAKER & CASPARIS.

Editorial Chat

The falling of the snow, the decoration of the home and the workshop with the evergreen reminds us that we are again to renew our Christmas greetings and assist others to enjoy this one holiday in the year when we are all children once more and should enjoy every hour of that day as such. Prosperity's car has favored the building material interests and the editor of *Rock Products* and his co-workers wish you a merry Christmas and extend to you our best wishes for a prosperous and happy New Year.

Timely Thought.

When you close up the books and you have recovered from Christmas festivities, just make up your mind that you are going to be one of the many to promote the interests of your industry without regard to what your competitor is doing or what he has said against you, and this will mean to the whole industry in 1907 a much greater prosperity, and when we close the books for 1908 we will have accomplished greater results than in the past because, it is with regret we say it, many of us have been narrow in our ideas as to the conduct of the building material business, and instead of fighting the enemy we have been fighting ourselves. The slogan then should be, "let's get together."

The Artistic.

When the most accomplished and best thinkers of the architects have satisfied themselves that the Stone Age is on, the material men will get greater co-operation from them. Never, however, will this greater prosperity be accomplished unless there is more team work in the trade. There is nothing that succeeds like success, and if by influence, suggestion, thought and effort, the architect, the building supply man, the quarryman, the contractor, all are yelling for more artistic, better constructed homes and workshops, the man who pays the bill will be influenced to spend his money and this will mean greater possibilities in extending the operations that we are all so much interested in.

Raw Materials.

The basis for delivering to the customer of well manufactured material should be worked out and adhered to. You can't build a good building unless you have good material, and when the contractor gets it he should mix it properly so that the integrity of the construction will be maintained. While it is our belief that the past will demonstrate that the quarrymen, cement, lime and plaster manufacturer has, generally speaking, been very careful on this point, yet we know there are cases where there are people in the business who are too smart for the permanent prosperity of their institution, and the influence of their transactions stains the proud escutcheon of our industries, and we must try by tactful suggestion to make them see that their profits will be just as great in doing business "on the level" as in "skinning the grade." We are not desirous of laying this blame on any one branch, but the low prices prevailing in the various lines of building materials in times past have been responsible for some of these short cuts which have been inherited by contractors, and an occasional bad job has been the result. But if we are all jealous of this integrity in the building material line, the future will not record many of these failures because of dishonest mix or skinning in the material to make up the difference in the price because the business has been taken too cheap.

Give It a Name and a Standard.

Our Maker has provided raw material for the manufacture of products that will and is the basis for construction of a permanent nature, and one of the troubles of the past has been that it is considered as cheap as dirt and that's why a proper appreciation has not been manifest of all the manufactured stone products. We are to-day in the short pants period of the Stone Age, and if you get the price high enough every body will talk about you and use your material, but you

should have a brand for particular uses, whether it be cement or lime or plaster, and if you will make the quality right and then live up to it there will be no more talk of cheapness, and the advertising matter will insure its consumption because it is a household word. Don't be influenced by the thought that the other fellow's stuff is better than yours. Make yours so that it will hold water and you need not worry about the outcome.

The Quarryman's Troubles.

The sales books of the machinery concerns catering to this business evidence the fact that more new appliances have been put in the quarry for converting the raw product into pulverized stone up to a 4-inch ring than any year in our history, indicating that quantity has greatly been increased for new and old uses. We all knew why this was so, but that did not relieve the quarryman from many inconveniences from particular lack of cars, non-delivery of machinery, scarcity of workmen and, in many cases, a price too low. It is to be hoped that the pressure brought to bear by the business interests and the experience gained by the railroads will prevent a like condition existing again. This and many other things that have been hardships to the quarryman in the past year should, however, have taught him the lesson that the maximum price of the output of the quarry is none too high, considering investment, time and effort necessary to carry out these large contracts. In this connection, it might be noted that J. E. Defebaugh, editor of the *American Lumberman*, after consulting with the largest operators in lumber, has called a meeting of the shippers in the building material lines, particularly lumber, to be held at the Auditorium Hotel in Chicago January 4, to present information, and if possible, memorialize Congress to influence the railroads in some way to prevent business interests from being tied up as they have been in the past four months and probably will be for the next three months for lack of equipment, and suggest-

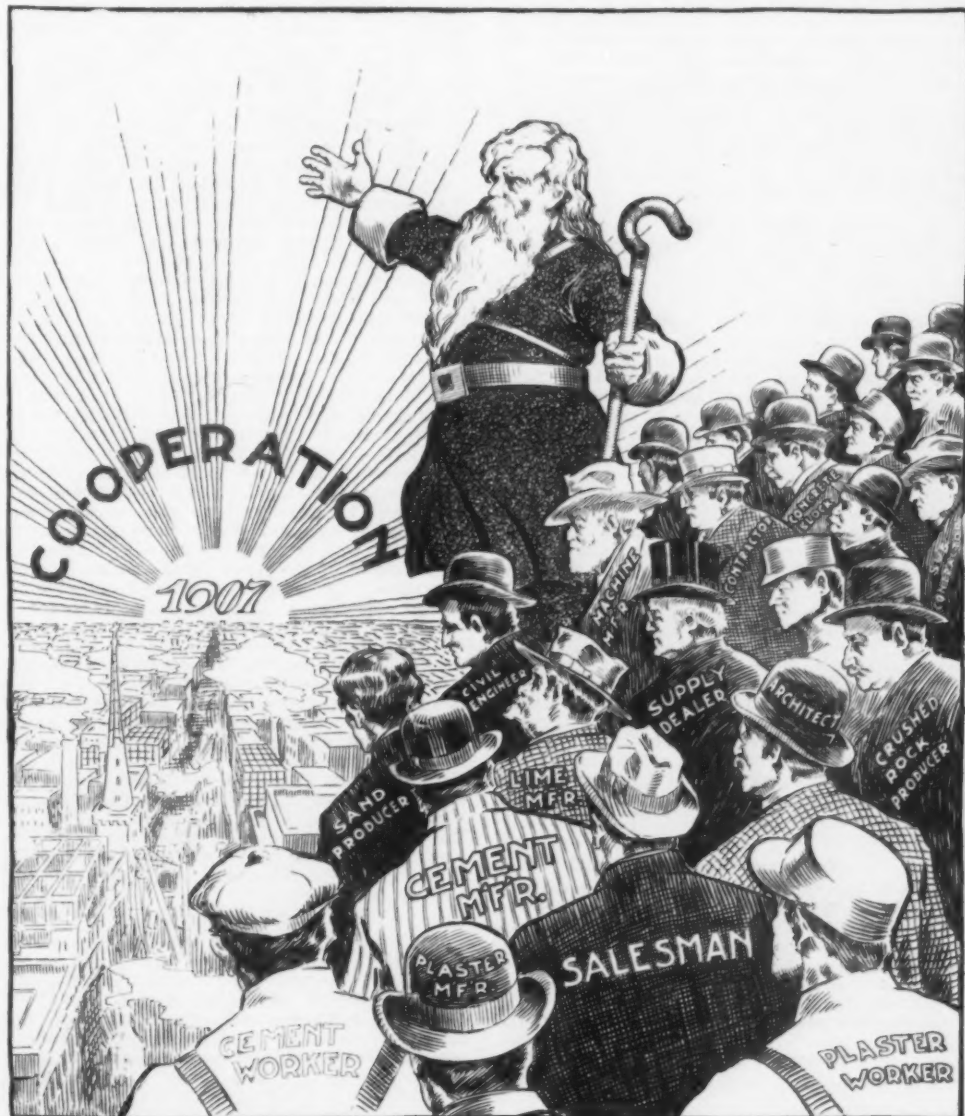
ing that a demurrage law be enacted for non-delivery of cars, to act similarly to the present law of railroad demurrage, which the shipper must pay for holding cars longer than a certain period. We believe that this action will be a good thing, if it does nothing but spur the railroad managements to greater effort to give satisfactory service to their customers; but we most seriously object to any rabid action that would be an injustice to the railroad management, for generally speaking, you can say that the railroads give the shipper excellent service.

Fifty Millions for Rivers and Harbors.

The most satisfactory meeting that we have ever attended was held in Washington two weeks ago and was composed of representatives of commercial bodies from Maine to California, making up the Rivers and Harbors Convention, 1100 strong. By resolution this meeting asked Congress for this annual appropriation, that the greatest waterways in the United States might be improved and used for the benefit of the business interests, and as for instance, the greatest railroad operator in this country to-day, James J. Hill, has recognized that the railroads have not built enough lines to take care of the increased business in this growing country, and suggests that we could use to advantage as more transportation facilities than now forms the net-work of America. The stone industry in all its branches is particularly interested in this proposition, not only because its product is dead-weight, but this investment by Congress will be divided up in a large measure between the stone operators everywhere.

Ship Subsidy.

When great machines are specked up to the highest point of efficiency, the best results are obtained by running 365 days in the year, and since we Americans believe this, we produce more than we have a market for about every seven



"THE PROMISED LAND."

years. It is for this reason that most active men approve of some legislation that will encourage a merchant marine, to take advantage of "the peace and good spirit that prevails between nations," and if we have the boats we will certainly make the goods and our foreign trade will be enlarged, and we may then hope to keep our mills running at all times and insure continuous prosperity. We would not, however, have Uncle Sam overlook his bank account or embarrass himself with too great appropriations; but it is our belief that the men who are in Congress to-day, while not allowing extravagant misuse of subsidies, will at least put our shipping on a par with our greatest competitor to-day (Germany), and our exports would exceed our imports, and thus the per capita individual wealth would be increased, and the tax on rich man, beggar man, thief, would not be perceptible. If we are going to collect dividends on the Panama canal investment and be a unit on the theory that "to expand is to expand," we will endeavor to influence our Congressmen to vote for a ship subsidy bill that will be practicable and satisfactory even to the conservative citizen.

The Sensational Newspaper.

It was rather amusing last month, even to the layman connected with the building supply business, to note the comments by the daily papers on the announcement by Rock Products that the North American Portland Cement Co. had been formed. They came out in scare line heads announcing that it was an effort to form a trust and thus make the government pay exorbitant prices for their large requirements for Portland cement for the Panama Canal. The facts are, this company was formed to give a greater stability to the cement industry and make it possible to maintain a reasonable market for cement, to discourage stock jobbery in the formation of new companies, to collect on and protect patents of the stockholders of this company, and above all to add to the prosperity of the business by encouraging the use of cement. The trouble of the business in the past has been that it has either been a feast or a famine. It happens that this is a feast period; but with the increased production assured for 1907 without a safety valve where millions of dollars are invested in a great industry, it could be a continuous famine. It is our belief that instead of being a menace to the business this new company will be that safety valve.

Experience Wanted.

While in New York the other day we noticed a new building that was being constructed of reinforced concrete. In mentioning the matter to a large cement operator he said: "Did you notice that in placing the reinforcement in the construction of the walls the contractor had placed them all upside down? When the foreman on the job was approached on the matter, he said, 'Well, this is our first concrete job; we really didn't know which way to put them in and got started that way and so just continued.' Now, what do you think of that? What is the use of our unusual care in the manufacture of cement that it may be up to specifications, if you have a lot of lobsers like that who will mix it and put it in the building, and then if the building falls down blame it on the cement?" Another bright genius made a complaint the other day on the quality of cement because it hadn't set properly and the forms had only been on over-night and lumber was scarce and he just took them off and then he complained of the setting of the cement. But, notwithstanding these freaks you'll find contractors with lack of experience and extreme large proportions of gall. It should be resolved by the cement manufacturers that where a contractor don't know his business any better than the cases mentioned above, they should refuse to sell him cement. I know it would eliminate from the business a lot of good fellows that mean all right, but it would add to the material prosperity of those interested in this line.

The Sweet With the Bitter.

I have had occasion several times recently to call at the office of the Combustion Utilities Co., of New York, in which Henry L. Doherty is president, and Carleton Ellis is general manager. I was struck with the extreme courtesy and tact of the gentleman who received me, and I afterwards found out that his name was William C. Dryer. The attention given to the caller was so satisfactory that I was struck with the difference, compared with the many offices in New York City, and in fact all cities, even in small towns, between

my reception there and many other offices, and I pride myself on being able to get an audience anywhere, and in twenty years experience have only had cause to complain of two discourtesies; therefore, you will not wonder why I ask who was responsible for what I consider good policy in the management of this company. It turned out that Mr. Doherty, who is the head of the firm of Doherty & Co., bankers, as well as a number of other large corporations, has studied that problem and believes that much time would be saved, more business done and satisfaction prevail both to the visitor and his host, if a courteous reception was generally accorded by business houses. As an illustration, Mr. Doherty believes that if he controlled, all the banks would have enough tellers on duty during the busy hours so that there would be no line of depositors waiting in front of the teller's window, and greater efficiency would be gained by the better service given to the active business man who needs every minute of the business hour. Mr. Doherty and his associates have our congratulations on their reception committee, and if his suggestion could be carried out there would be no place for the boor and business would be conducted in shorter hours and with greater satisfaction.

The Broad-Gauge Spirit.

In years gone by when business was conducted on a primitive scale our fathers probably inherited from their ancestral surroundings in the older countries a narrow gauge way of looking at things and particularly where a competitor was concerned. I am sorry to say that in some institutions, as well as in all business houses in Germany, the competitor, even though he may not be in competition and live three thousand miles away, is an unwelcome guest, especially if he wants to learn how this manufacturer makes his goods. But I received a letter the other day that gave me some encouragement, I thought of singing "O, Happy Day," and this was what it was all about:

W. S. Kuehn, realizing that he did not know all about the modern way of making lime, although he had been reading Rock Products and found that new ideas were being discussed in every issue, after calling upon some of our machinery advertisers, visited New England, perhaps the last place you would expect a Westerner to go where he was expecting to get the information all from the other fellow and could only come in with his Western breeze and extend the hand of good fellowship. Now Mr. Yankee has been living a long time, ever since they found Plymouth Rock, and he doesn't receive you with both arms wide open, although he will be courteous and accept you as you are, but he will size you up. I know from experience they are the best friends in the world when they know you, but our friend happened to be the right kind of a fellow and it was a case of Greek meet Greek; for here is what he says:

"In the Canaan district I visited recently, seeking information about the construction of up-to-date lime kilns, the application of economies in burning, and the treatment of this product in the quarry. I visited the New England Lime Co.; the Connecticut Lime Co.; the Canfield Lime Co., and the Hadsell Lime Co. I found them all up-to-date operators and should be, and I believe are trade winners. The managers of these concerns were certainly good to me. Their courtesies to a poor Westerner who is trying to peg a few holes and keep abreast of the times by the exchange of information with brother manufacturers were certainly appreciated. The courtesies, extended to the writer by these Eastern friends deserve special mention, and I hope the editor of Rock Products will assist me in memorializing these gentlemen and extending them an invitation to come to the Rockies and receive the open-hearted Western welcome. I shall go back to Montana loaded with up-to-date ideas and add new kilns and bar-reling equipment."

The National Lime Association has been responsible for the spreading of the broad gauge spirit because its principal manufacturers of lime in the United States have come together once a year for several years past and they have benefited the lime business by broadening their ideas, and they will all 'fess' up.

Fireproof House.

While bumping along in the smoking room of a Pullman sleeper the other night, and by the way, that is the best way to get truth and nothing but the truth, I met H. F. Hawes, one of our Louisville architects, and it didn't take very long for the writer to stir up an argument that brought Mr. Hawes' ideas of a fire-proof house. This was after, however, we had passed a resolution by

unanimous vote, recommending that all millionaires should spend their surplus money in artistically built fire-proof country and city homes, and thus build monuments for themselves and give the architect an opportunity to display his talents, and incidentally pay a good price for high class building material. In speaking of fire-proof residences, Mr. H. Hawes said: "We have constructed several country residences this last fall, and the exterior is pebble cement finish, and I confess they appeal to be as being artistic. I believe our contractors have constructed them well; in fact, I know they have, for as an illustration, in order to confine any fire that might happen in one room, the four walls and the ceiling was built of sackett plaster board, and between the rough and the hardwood floor we used asbestos paper. The application of fire appliances make it possible to put out any ordinary fire, so with concrete foundation reinforced cement walls, and slate roof, we have an absolutely fire-proof house, and, as far as beauty and comfort is concerned, it can't be beat."

Speaking of interior decoration, we had an experience meeting on how to best work up the by-products of the quarry in order to beautify a man's house, especially if he has the money to spend, and of the many things we figured out was the artificial marble bath tub, the tiled floor and wainscoting, which, by the way, could be used in the halls, and if we could ever get Italian workmen enough, the by-products of the marble quarry or artificial stone of different materials could be moulded so that the expert designer or architect could construct the interior of the home more beautifully than the old kings who had so much money, and for little more expense than if it is all done in hardwood. This exemplifies this fact that there is a place for all materials. Mahogany in some places is very much better than materials of the rock. When you discuss the question of the application of these materials, you are rebuffed with the statement that only the 'Hoggenheimer' rich can afford these things, but that is all a mistake. If you will cultivate the artistic and prepare these materials in an attractive form, it will be an easy matter if we will pull together to introduce and insure the greater consumption of the products of the rock.

Exploitation Necessary.

We regret to note, in our regular rounds from one end of the building material trades to the other, that there seems to be a lack of discrimination and often an absolute "don't care a J— spirit" in our craft, and as we are part of it we regret to see these two points because we feel that every branch of the industry should exploit their wares where it can do the most good and enlarge the volume of the business we have at heart. In the ten years' connection with the lumber trade we remember this same spirit prevailing some years ago, but nowadays the men who once thought \$100.00 invested in their own trade paper should be spread over ten years, will spend \$25,000.00 for a write-up to exploit their lumber. The result is they are making more money than anybody.

The stone lines to-day need good publicity more than any other branch of the material interests, and you should do your share towards placing before the public the possibilities of your material and your capabilities of taking care of a contract when you get it. But discrimination must be used in the expenditure of money in exploiting materials, for there is more money thrown away in advertising for lack of knowledge than hits the spot. The contention of Rock Products is that the best judge of what periodical can give you publicity is the man who is in the field and is in touch with the buyer in the various lines. See what trade paper is not only fighting the battles of the various industries from the quarry to the dealer and the architect, but is by suggestion, thought and effort assisting in the education of these gentlemen for better condition in the material business rather than be guided by a supposed expert who never sold a car of anything, or even a pair of pins, but is supposed to know all about publicity because he took some lessons by mail. We were particularly struck with the intelligent handling of the advertising proposition from an exploitation standpoint by not only the high class books and illustrations of the Atlas Portland Cement Co., of New York, but the dignity and taste they used in displaying the possibilities of cement at home and on the farm, as well as about in three lines saying, "we manufacture thirteen million five hundred thousand barrels, our brand is the Atlas, we have the mills and make the goods."

Plaster.

The Art of Plaster.

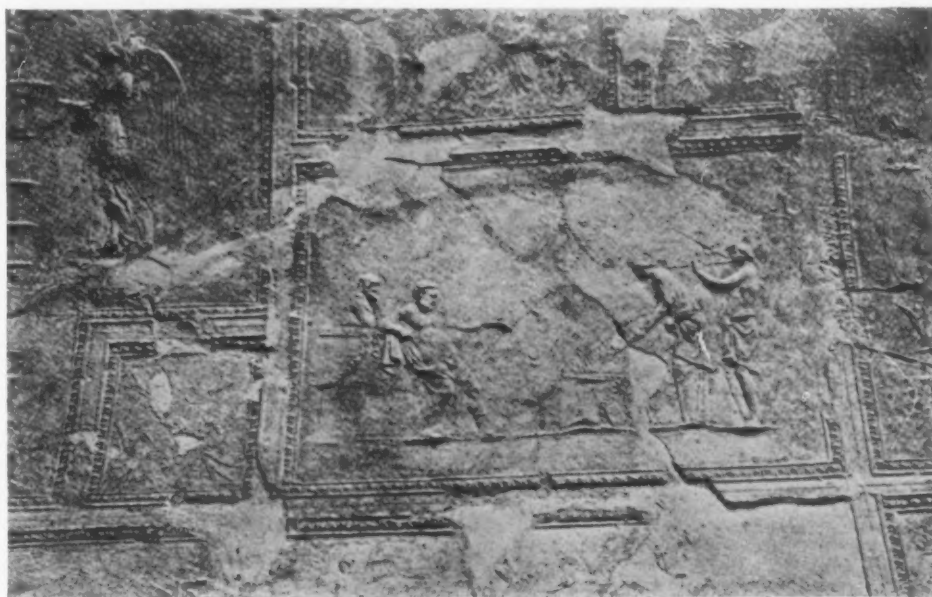
In this age where trains, money and mechanical appliances are greater than at any time in the history of the world, we, as an industry, yet lack two very important points to ever accomplish what our forefathers did in the art of plastering, unless we will eliminate our greed for money to some extent and teach and encourage the artist in the plaster branch to attempt higher things. In other words we are behind the times.

Away back there when the Romans were a power in the first century, notwithstanding the fact that materials were hard to get and transportation was all confined to the leg power, thank God, they had the genius and took advantage of what they had in materials, and we must of necessity be more strenuous in our efforts to educate ourselves and the builder of the home through the various channels of the architect, contractor and manufacturer in order to get started, and that is the excuse for this article.

We have gypsum. We have all the component parts of an excellent plaster that can be moulded into any shape. We even have the incentive, but we certainly have been backward in taking advantage of our opportunities. As we look on the illustration of the vaulted ceiling of stucco decorations of the first century, as illustrated by Millar, we see where the artist with colors or in copper has taken advantage of these old ideas to gain new ones. The architect that is an architect is desirous of recommending more artistic decoration in the construction of the interior of the home, and we have the millionaires who are not afraid to spend money when they have a good reason for it, and often times when they have not, and it all comes back to the gypsum manufacturer and calciner and plasterer to start the ball rolling.

What are you doing to-day to increase your sales in new lines where the plaster material from your quarry and plaster mill will find new channels of use and yet work on the incentive that actuates each business man's effort to bring about this era of plain and decorative plastering that will increase the volume of the business? We must say for the plaster manufacturers that their new specialties under a brand have made great headway, but the industry has only scratched the ground. The possibilities with so many money kings in your neighborhood and mine have only to be worked out and that is the reason for a series of articles that will be printed in *Rock Products*, showing the modeling in plaster for interior and exterior work to beautify the ceiling and adorn the walls, to decorate the exterior and, above all, to increase the volume of business for the plaster manufacturer. Will you do your part if we keep offering suggestions? We would gladly receive from your pen your experiences in the way of enlarging the scope of your business.

It is generally supposed that there was only one Moses, he of Wilderness fame, but when we go into the history of working in plaster starting in the early centuries, we discover that the Hittites, Assyrians, Egyptians, Greeks, Romans, and the Moors, in their time, had leaders of thought and men and we could go on until the change of thought and the laxity of effort allowed the artistic as well as the commercial end of the plaster industry to decay. The extravagant expenditures for stucco work, as found in Western Europe to-day, which was developed by the Venetians, the French, the Dutch, the English and the Scotch began to go into decay rapidly about the period of Sir Christopher Wren in England and it is only in recent times and in our own country that there has been a definite revival. The best examples have been developed at the great World's Fair at Chicago, where the im-



STUCCO DECORATIONS ON A VAULTED CEILING, ROME, FIRST CENTURY.

pressions of exquisite classic architecture were developed in stucco in a manner that it never had been before. Beginning at the Pan-American Exposition at Buffalo the tonings of color were developed in stucco work showing the advance accomplished and the study that had been put into it by able minds in this country. Then at the Universal Exposition at St. Louis the stucco work outclassed anything that has ever been seen by people now living. The Mines Building, in particular, was the most original architectural theme ever shown in America and was executed in a masterful way. And this carries out our thought that the development was brought out through the intimate study of the classic models and in this building classic models were set aside and an absolutely new theme, both in general design and in detail, combined at once the Obelisks of ancient Egypt, the Mission type of early Spanish colonial architecture and modern space saving provisions, which shows that there is a mind and a school of American architecture thought represented by men who are able to combine everything that has been produced by the ancients and adapt it to modern requirements in order to get out of this extremely rich material all that art and adaptability can suggest.

Deposit in Utah.

NEPHI, UTAH, December 11.—T. C. Winn, manager of the Nephi Rolling Mill, is at present interested in the development of a deposit of gypsum about three-quarters of a mile east of the city. A modern mill will be built on the main line of the San Pedro, Los Angeles & Salt Lake Railroad, at a cost of \$40,000.00 to which the gypsum will be conveyed for the manufacture of hard wall, building, dental and other plasters.

Trade Hurt by Car Shortage.

MARYSVILLE, KAN., November 30.—Shortage of cars is the serious drawback to the business of both the Blue Rapids Plaster Co., and the Electric Plaster Co. This question has assumed immense proportions and is quite a menace to the successful conduct of the plaster business in this vicinity.

Have Built Addition to Plant.

WARREN, O., December 13.—The Elastic Pulp Plaster Co., has just completed an addition to its already large plant. The new building is 20 by 60, two stories high. New machinery is being installed, which will double the capacity of the plant.

The Fayetteville Gypsum Co., has been incorporated at Fayetteville, N. Y., with a capital of \$1,000.00. The incorporators are J. F. Milker, J. P. Curry, C. C. Milker, New York City, who have also recently incorporated the Newton Creek Plaster Co.

New Plant in Oklahoma.

ALVA, OKLA., December 15.—The Kimmert Manufacturing Co., of St. Joseph, Mo., has broken ground for the erection of a plant to manufacture plaster board in close proximity to the plant of the Oklahoma Plaster Co. Mr. Kimmert will build the plant 40x200 ft. of his own plaster board, and will also construct residences here to show the durable qualities of the material. The St. Joe plant will be moved here and with additional machinery the plant's capacity will be increased fourfold.

Utah Plaster Company.

SALT LAKE CITY, UTAH, November 28.—The Utah Plaster Co., has just been incorporated here with a capital of \$150,000.00. The officers of the company are: President, W. J. Robinson; vice-president, W. J. McIntyre; secretary, J. W. West; assistant secretary, W. Bert Robinson; treasurer, Edward L. Burton. The directors are E. S. Wright, R. E. Miller, James H. Moyle, Milton Jennings, A. E. Snow and B. F. Grant.

Plant Is Now Running.

CUBA, N. Y., November 26.—The new plaster mill of the American Wood Fiber Plaster Co., recently rebuilt has been running full time since October 1. Their first plant was destroyed by fire about six months ago. The new building just finished is much larger than the first one; new improved machinery has been installed and the company is enjoying an era of prosperity.

Still Drilling at Jamesville.

JAMESVILLE, N. Y., November 24.—E. B. Alvord & Co., who have gypsum quarries some three miles from the village, have been making surveys and drill holes looking for gypsum material a little closer to the village. Harry Conklin, manager of the Alvord concern is in charge of the work, and has sanguine hopes of ultimately landing material of the proper consistency.

Has Had Busy Season.

MOUNDSVILLE, W. VA., December 1.—The Moundsville Wall Plaster Co. has had a busy season and looks forward to increased business during the year 1907. H. Hess has withdrawn his interests from the company, leaving William Fischer and J. W. Peters in command.

The Eureka Wood Fibre Plaster Co., has been incorporated at Nashville, Tenn., with a capital of \$5,000.00. The incorporators are R. C. Graham, W. E. Legg, A. C. Carroll, P. J. Nellegan and J. Hodge McLean.

A serious cave-in occurred recently at Mine No. 2 of the Grand Rapids Plaster Co., Grand Rapids, Mich., causing the death of two of the workmen.

Wood Fiber Plaster.

The old time wall plaster had its defects, including the tendency to chip and crack on the wall, to disintegrate under certain conditions, besides being a distinct conductor of sound, heat and cold. An important step in the plaster manufacturing industry is the utilization in the mixture of a material which renders the product free from the undesirable qualities of former times, besides having distinctive qualities making it preferable to the artisan who applies it, as well as to the architect, contractor and building owner.

The basis of the modern product is calcined gypsum (plaster of paris), while the embodying of wood fiber in the mixture gives it the desirable qualities sought by leaders in the plaster world. Wood fiber is a substitute for sand, and wood fiber plaster, properly made, should be used without the addition of sand. While this is true, sand may be used in this commodity in the same proportion as is permissible with the regular "neat" gypsum plasters. J. W. Voglesong, of Elyria, Ohio, after experimenting, found that wood fiber, suited the purpose admirably, and claims to have acquired the first patent ever issued for using wood fiber in plaster.

The next step was to find a method of preparing the fiber. Wood fiber is wood reduced to shreds by a machine especially adapted to that work. Any kind of a soft wood may be used that is free from resin, but particularly elm, willow, basswood, cottonwood, poplar and quaking asp have given splendid results. A cord of wood will produce enough fiber for 40 tons of plaster. The wood is reduced green and is mixed with the gypsum without drying. It comes to the machine in bolts 24 inches long and from 6 to 20 inches in diameter.

In a ton of plaster the approximate weight of the fiber is 100 pounds, this being equal in bulk, before mixing, to the bulk of the other materials which make up the difference of 1,900 pounds. The bulk of plaster creates wall-covering capacity. The use of the wood gives to wood fiber plaster its essential characteristics—toughness, non-conductive qualities as applied to sound, temperature and electricity, adhesiveness, flexibility and lightness combined with strength.

A ton of wood fiber plaster properly made will easily cover 150 yards of wall used upon five-eighths inch ground and three-sixteenths inch key. A sand-lime plaster will cover approximately 85 yards under similar conditions. Being light and smooth, the plasterer prefers wood fiber plaster to all other mixtures, while the carpenter is enabled to cut or chisel or bore it without injury to the sharp edges of his tools.

Wood fiber plaster will adhere to rough boards or to metal or to other kinds of lath, not requiring any opening or "key," as is necessary in the case of sand plasters, saves width sufficient to prevent the lath from "buckling," and when on the wall is free from chipping or cracking.

It is shipped dry in sacks, so it may be elevated to any part of the building and mixed by the addition of water in a small box in the very room where it is to be applied. Wood fiber plaster is much preferable to and when properly made is no more expensive on the wall than sand plasters. The use of wood fiber plaster is by no means to be considered as an industry for new companies. It is being adopted by older manufacturers and by the plaster trade generally.

Blazing the Way.

The operations of the United State Gypsum Co., with headquarters at Cleveland, Chicago and Fort Dodge, have been increasing in gypsum and calcine goods with the increased demand for high grade plaster. President S. L. Avery, of this company handed us a booklet the other day. He meant no harm, but it made us stop and think, for the title was "Here's Your Finish." But then we saw the word "Universal" and thought there must be something more. We looked on further and here is what he says: "Tell your plasterer it is great fun to fill up the 'cat faces' with Universal," and we discovered that that cat had cavities of large proportions at that. We were still up in the air because when we started off the heading was "At Last," and they remarked "A perfect plaster finish." We presume they meant Universal. Then they got into politics. They said "A finish absolutely free from all the imperfections of

the old fashioned lime putty." They put this in red ink, and here is how it reads "A finish without lime," and now you know that your Uncle Peter Martin and the writer looked up and took notice. You will find a lot of catchy business conversation in this little booklet, and it is the belief of Rock Products that this character of high grade, tactful conversation has increased the volume of business in the hard wall plaster. But notwithstanding the fact in the beginning that the U. S. G. said "Here's your finish," we read the booklet, from cover to cover, and we knew, and you will know when you read it, that they are in earnest for they said: "Wisdom in building points strongly to hard mortars for plastering walls, and Universal for the final finish."

Lath Versus Plaster Board.

The most important question before the jury in building supply lines nowadays is "shall we discard the lath used in the past and use plaster boards?" From the evidence brought in by the defendant, it appears that \$5.00 lath at the mill is getting a black eye and Sackett plaster board is gaining ground. In a discussion of the matter recently an architect said: "Why, really you can not afford to use lath nowadays. These lumbermen think that because it comes from their mill we ought to pay the same price for lath that you would for clear lumber to make interior finish out of, and so we are specifying Sackett plaster boards. It only costs about two cents a foot more than lath, and then you have fire-proof material, and it is very satisfactory."

Evidently this experience has been told before the Association of Architects, for the increased production of the mills manufacturing this board by next March will make it possible for them to ship one hundred thousand feet per day from New York state, Iowa, Grand Rapids, Mich., and other points where their mills are in operation, and this increased production is due to increased demand. On another page you will find an illustrated talk from the manufacturers and handlers of plaster board. Look it over, and perhaps this material will be the means of increasing your sales, if you will dig deep enough.

Big Plaster Plant is Planned.

NEW YORK, N. Y., December 15.—A contract has just been awarded to the John W. Ferguson Co., of Paterson, N. J. and New York, for a large plant to be built by the H. F. Taintor Manufacturing Co., 200 Water Street. This plant which will be built of brick and mill construction is to be erected at Bayonne, N. J., and will include a main building 357 by 125; two storehouses, one 210 by 125 and the other 90 by 60, and a power house of about 200 horse power. The company is one of the largest manufacturers of whitening and Paris white in this country. Fred S. Hinds, architect and mechanical engineer, of Boston, designed the plant.

Progressive Columbus Concern.

COLUMBUS, O., December 15.—One of the most progressive concerns in this vicinity is the Ohio Wood Fiber Plaster Co., with factory, warehouse and office at Vine and Kilbourne Streets. Two brands of plaster are manufactured, the Masti-Wood Fiber Plaster, and O. K. Wall Plaster, and both are leaders in their line. The company reports a most successful season, both in amount of orders and testimonials as to the use of their plasters in practical work.

Had Good Year.

The Elyria Plaster Co., of Elyria, O., reports this year's business almost double that of last year and are even looking forward to greater things in the spring. W. S. Griswold, secretary of the company, says they have been doing a great deal of contracting this season and have done so well that they expect to branch out in the spring.

Have Had Busy Season.

KENTON, O., December 11.—The Wells Plaster Co., reports a busy season and large demand for Wells plaster boards, the important points of advantage claimed for which are their adaptability for back plastering, outside sheeting, and dealers for dividing walls.

Side Talk.

The Brownie Block Machine.

The Brownie Block Machine Co., at 1613 Main Street, Kansas City, Mo., has been manufacturing machines using the two piece system for the past few months. The Brownie is a side face machine and each part of the face is tamped as the block is made. It gives a 50 per cent air space both vertically and horizontally. The Brownie makes any and all sizes of blocks. It will make two L shaped blocks 32 inches long, 9 inches high and any part of same divisible by 4 inches at one operation all on the same pallet. It also makes a 32 inch block with an eight inch dead air space and an eight inch band with only the additional expense of 4 inches of concrete on the L. This has been designed to meet the heavy construction problem.

By filling the eight inch space with concrete, it is possible to build a railroad bridge or any heavy construction, requiring great strength. If a solid or hollow block filled with concrete is desired for foundation, you can also make this on the same machine. In fact, by the numerous interchangeable parts almost any character of block can be manufactured on the Brownie machine. It is operated with great ease and one of the features of the machine is the truck system. This truck runs under the block machine and the block is made on the truck. As soon as it is finished the machine is opened and the block rolled away. The wooden truck is made of 2 by 6 inches 16 feet set at the top of the track of the machine. The block will almost roll down by itself. A small boy is all that is required to handle the block and do the watering until the block is ready for the building. This is not only a labor-saving device but precludes the possibility of injuring the block by removing it when it is green as a light jar will cause the block to crack or disintegrate when it is green. The Brownie Block Machine is thoroughly covered by patents and the inventor, T. J. Johnson, is a well known Kansas City gentleman.

Offer Plant for Sale.

The Pettyjohn Co., Terre Haute, Ind., in another column offer the plant of the Terre Haute Pressed Brick Co., for sale, owing to the fact that their business in the line of concrete machinery is growing to such an extent, not only in the United States, but in many foreign countries as well, that they need the time which such a large institution as the brick plant calls for its proper management. In speaking of their offer to sell the brick plant they say: "We are undoubtedly offering a big bargain in this brick yard to a practical man. The demand for brick has never been supplied during the spring months for the last five years and brick are sold at a fine margin of profit. The owners do not need the money but do not want to see such a valuable business go to waste, and would be willing to sell to a practical man on easy terms, for the business will pay for itself with ordinary intelligent operation and honest dealing." Terre Haute is one of the finest building towns in the United States and has doubled in population in the last five years. It has unsurpassed transportation facilities and is a good hustling substantial business town of 50,000 inhabitants.

Important for Cement Men.

After thirty years of experience in the manufacture of sand-papers, and other papers of extraordinary strength, one becomes imbued with that one idea, strength in the manufactured product. The West Jersey Paper Manufacturing Co., Front and Elm Streets, Camden, N. J., has been thoroughly investigating and experimenting with the manufacture of a paper bag that would withstand the rough handling accorded the shipment of cement and hydrated lime, and has now ready for the market, a reliable paper package.

As to Jeffrey Pulverizers.

F. H. Angell, the crusher and pulverizer expert of the Jeffrey Manufacturing Co., Columbus, O., attended the recent convention of Cement Manufacturers held at the Hotel Astor in New York. The Jeffrey swing hammer pulverizer has been developed and perfected to such an extent that it has become an attractive machine for every kind of grinding, crushing and pulverizing operation. The exceedingly heavy construction and selection of high class steel for all the heavy wearing parts have even exceeded the designed calculations, and the extent of the improvements accomplished is readily recognized by the long list of users of Jeffrey pulverizers, who compose the most solid and experienced concerns in their respective lines. The machine is built in a large number of different sizes so as to make it available for the widest range of crushing and pulverizing propositions of any single pattern that has ever been offered to American rock manufacturers.

The cement manufacturers find the Jeffrey swing hammer pulverizer of the larger sizes, a very economical machine for the intermediary raw grinding. At this step of the operation of manufacturing cement it increases the capacity by advancing the dry raw material to its completion in such a uniform way that the expense of finishing the grinding of the raw material before it enters the kiln is reduced to the minimum of expense. Some of the oldest cement mills in the country have adopted and are now using the Jeffrey pulverizer for this stage of the manufacturing process, while a large number of the new cement mills now under construction, or about to be begun has specified the Jeffrey machine to take care of the intermediary raw grinding proposition.

The smaller sizes of this pulverizer are to be found in many of the plaster mills, and the full range of its usefulness can only be fully appreciated by a brief interview with Mr. Angell who will be delighted to furnish complete particulars with reference to any special requirements. He conducts an experimental crushing establishment to demonstrate the exact nature of work that the Jeffrey machine can be depended upon to turn out.

Waterproofing Concrete Blocks.

R. R. Fish, of the Sandusky Portland Cement Co., Sandusky, O., who made such a favorable impression at the Detroit Convention of Cement Machinery Manufacturers with his demonstration of the Medusa Waterproofing Compound for concrete blocks and bricks, has been making an extensive campaign introducing that highly commendable article. Mr. Fish has a way about him of presenting the matter in hand in such an attractive way that every architect or manufacturer of concrete building materials is glad to listen to what he has to say, and it is wonderful how they remember the interview and the semi-comic way he has of riveting their attention to his waterproofing compound. Mr. Fish is backed by a high grade material, which makes it easy with his particular gift as a salesman and lecturer to secure the cream of the business in his especial line. He is to give his lecture before the National Association of Cement Users in Chicago, and will no doubt be highly appreciated.

New Caplintel Mould.

The Cement Machinery Co., Jackson, Mich., has just placed on the market a newly designed sill caplintel and step mould. It is becoming popular from the fact that it is the only mould of the kind yet offered to the consideration of the manufacturer of concrete commodities which is thoroughly adjustable, that is adjustable to different widths and lengths. Its specific details of the description are as follows:

Its adjustment runs from six feet down to one inch in length and from fourteen inches down to three inches in width. It is furnished in heights of 7½ inches or 9 inches, whichever the user desires. It is made of the very best materials and is reinforced in such a way that it is impossible to spring it. The side is arranged like a rule so that you can get any length in an instant by simply sliding the sides the proper distance. The width adjustment is arranged in the same way.

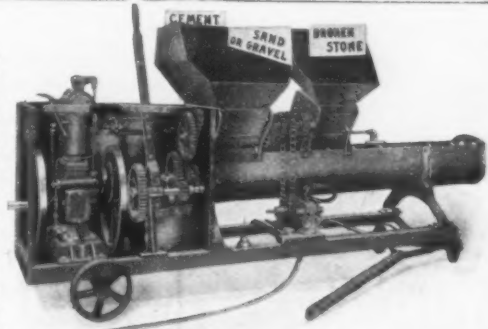
"Users of Sand-Lime Brick."

The American Sand-Lime Brick Co., engineers and builders of brick plants with general offices in the Great Northern Building, Chicago, Ill., recently compiled a booklet entitled "Users of Sand-Lime Brick." It is the best business orator in the interest of the sand-lime brick industry that has ever been published. It contains a large number of illustrations of handsome buildings that have been constructed of the famous white brick. The convincing feature consists of the exquisite architectural developments which are shown in the illustrations. The genuine character of the purpose of the compilers is demonstrated by the fact that they have used the broad gauged policy of not only exploiting some of the handsome jobs that have been constructed with brick coming from factories which they themselves established, but they have taken the best that they could find of samples of sand-lime brick made by the plants of their competitors. This gives the book a value which it could not otherwise have obtained, and at once demonstrates that the company issuing the book is confident at least that they are the peers of the machinery people catering to the industry. This booklet is well worth not only the perusal but the careful study, of those who contemplate entering the sand-lime brick industry and in inviting correspondence with regard to this interesting booklet John J. Moroney, the general manager, will take pleasure in giving the most expert advice in his plain honest way as to the advisability of undertaking the manufacture of sand-lime brick upon any given specific proposition.

The Garry Iron and Steel Co., Cleveland, O., has added to its line an expanded metal lath made from a sheet of steel, expanded in such a way as to form an economical plastering proposition. It is especially adapted for exterior stucco work, and as it becomes thoroughly enveloped in the plastering material the latter produces a perfect key. It is furnished in several gauges, either galvanized, painted or plain steel. Like everything else that comes from this establishment it is strictly high grade goods and meeting with a popular and ready sale wherever it is shown and known.

Single Mould Brick Press.

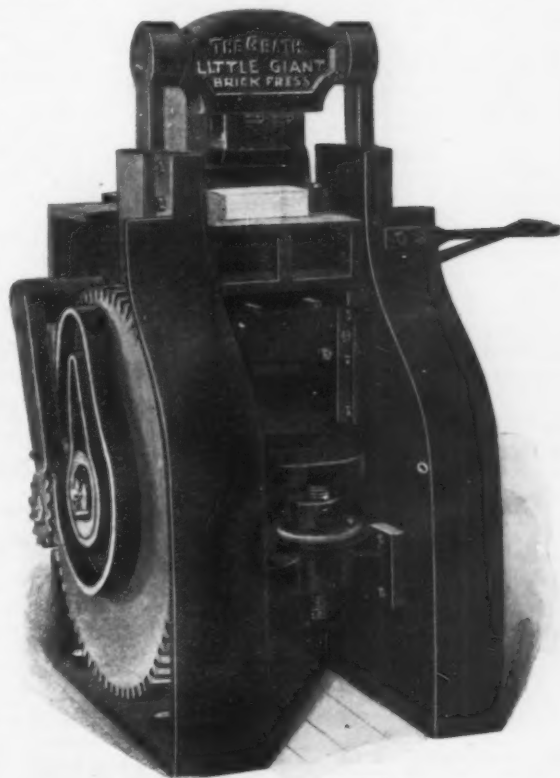
At the recent convention of sand-lime brick manufacturers held in the city of Chicago, E. W. Lazell, Ph. D., the official chemist of the association took occasion several times to recommend a single mould brick press. The Garth Little Giant one mould brick press, an illustration of which appears upon this page, was designed and built under the direction of Walter P. Garth, president of the Illinois Supply and Construction Co., 700 Tobin Building, St. Louis, Mo. The inventor is a brick manufacturer of large experience, and in designing this press kept his eye upon the economical requirement expressed by the four magic qualifications of simplicity, power, durability and compactness, which constitutes a perfect press. The press was especially designed for the sand-lime brick industry and in its construction it has been provided that the off-taker has sufficient time to remove the brick from the press before the charger starts, which assures that every brick is perfect as it leaves the press. It is claimed that no other vertical press has this feature, and every brick is pressed from both the top and the bottom. While especially designed for sand-lime brick of finest grade fronts it is also suitable for dry and semi-dry clay pressed brick. The capacity of each machine is from five thousand to six thousand perfect brick a day, and three horse power is required to drive the machine up to capacity.



EUREKA MIXER.

A Good Mixer.

The Eureka Machine Co., of Jackson, Mich., has a mixer which will handle all classes of material such as sand and gravel, or crushed stone and measure and graduate the different products as they enter the machine; an uneven mix is said to be impossible with this machine as the cement is fed into a hopper on the left hand side of the machine and then passes into the mixer through a gauge which let only as much through as it is set for and the sand, gravel, and crushed stone pass through a similar arrangement on the right hand side. In other words the contractor or operator can set the machine for one mix and go away and leave it knowing that the concrete going into the job is what he wants. A screen is put over the front of the sand hopper and nothing larger than two inch stuff can pass into the machine. A three inch screen is also provided for crushed stone. One of the good features about this mixer is that there is never over two feet of material in the machine at one time making it very easy running. A two horse power engine runs it nicely. All of the gears including the engine are enclosed in a steel casing. A rotary pump is connected and run by the machine power out of reach of city water. All in all the machine is a very good one and it will pay anyone interested in mixers to investigate. This company also makes a hand mixer on the same plan which is giving satisfaction. Catalogue D will explain the different sizes and styles in detail.



GARTH LITTLE GIANT PRESS.

The Fisher Hydraulic Stone and Machinery Co., with general offices in the Builders' Exchange, Baltimore, Md., requests us to announce that they are placing an extensive exhibit at the Chicago Cement Users' Convention occupying a space fourteen by fifty feet, where they will exhibit a complete line of their hydraulic power machinery in actual operation forming one of the most expensive working exhibits of cement stone machinery ever made.

Wanted and For Sale

One insertion, 25c a line; Two insertions, 50c a line; Three consecutive insertions with no change in the composition, 56c a line. Count eight words to a line; add two lines for a head.

WANTED—HELP.

BALL AND TUBE MILLERS for a large cement plant. Applicants should be men who have had experience in handling this class of machinery and are able to bring results. With application please give full information as to former experience and results gotten. Address Lock Box 25, Easton, Pa.

MANAGER to take charge of large lime plant in Virginia. Address Y 2, care Rock Products.

QUARRY FOREMAN—Applicant must be experienced in handling drills, dynamite and men. Capable of taking entire charge of a cement rock quarry getting out from 1,200 to 1,800 tons of rock daily. Salary from \$100.00 to \$150.00 per month, according to ability. Answer with details as to previous experience and references, Lock Box 25, Easton, Pa.

WANTED—POSITION.

AS FOREMAN or Superintendent of ballast quarry; have had twenty years' experience. Am perfectly familiar with gyratory crushers and all machinery necessary for operating ballast plants. Best of references. Address Y 16, care of Rock Products.

AS SUPERINTENDENT or General Manager, by an experienced operator in the manufacture of Portland cement. Reference furnished. Write Y 1, care Rock Products.

BY COMPETENT MAN of good habits and careful business training. Experienced in cement and building material. Address T 2, care Rock Products.

CEMENT AND CHEMICAL ENGINEER desires position in mechanical or operating department of cement or railroad company. Competent to handle the design, drafting and construction work contemplated by present or proposed cement companies. Experienced especially as assistant superintendent in charge of cement plant operation, designing and erection; also in track work and concrete foundations. Satisfactory references. Address Y 5, care Rock Products.

WANTED—MACHINERY.

COMPLETE Sand Lime Brick Plant Machinery, etc. Give price and full particulars. Address Y 4, care Rock Products.

SECOND-HAND double drum hoisting engine; 16 h. p.; good condition. Address P. O. Box 46, Mankato, Minn.

SECOND-HAND Gates Crusher, No. 6, Style D or K. Address P. O. Box 57, Morristown, N. J.

FOR SALE—MACHINERY.

AT A BARGAIN—Three simplicity concrete block machines, one standard Sand and Machinery Co. mixer; one dry mixer with elevator, block tongs, fixtures, etc. Will sell as a whole or part. A good chance for any one desiring to enter the concrete block business. Good reasons for selling. CHAS. L. McNUTT, Manager, 114 Poplar Street, Jackson, Tenn.

CHEAP—1 Standard cement brick machine (40 mold).

One Standard concrete mixer.

1,312 brick holders, belts, shaftings, hangers and pulleys.

This machine is as good as new, has only made 50,000 brick. Inquire of H. HOUGHTON, Detroit, Mich.

OR TRADE—Palmer Block Machine, 30 in., complete, used only a short time. CEMENT BLOCK CO., Bloomington, Ind.

ROCK CRUSHER, ENGINE, BOILER, etc., situated at Rockview, on the Cotton Belt R. R., in Scott county, Mo. Apply to MR. CHAS. BLATTNER, or Sturdivant Bank, Cape Girardeau, Mo.

SEVEN SECOND-HANDED Horizontal Sturtevant Mills 42 in. in diameter. Address NEWAYGO PORTLAND CEMENT CO., Michigan Trust Building, Grand Rapids, Mich.

SMITH TUBE MILL SHELLS, three with silex lining, 4x16 feet. All in A-1 condition. We offer the above for sale on account of rearrangement of our grinding department. ALMA CEMENT CO., Wellston, O.

THREE TUBE MILLS—Owing to changes in our mill room, we will have for sale three "Krupp" Silex lined tube mills, 5x22 feet. Can make shipment about December 15, February 1, and March 15, respectively. Make best offer. NORTHAMPTON PORTLAND CEMENT CO., Stockertown, Pa.

WINGET CONCRETE MACHINE, with all accessories and 100 pallets. Cost, \$750.00; will sell for \$550.00. Machine brand new, only used one day. JOHN O'CALLAGHAN, 1520 Main Street, Baton Rouge, La.

FOR SALE—PLANT.

CHEAP—An established business in a live town, manufacture sand and gravel brick. Capacity 1,200 M. Address E. G. KEMPER, Dallas, Tex.

CEMENT FACTORY, location in Iowa, close to good distributing point. All materials necessary for the manufacture of Portland cement in abundance. Address Y 3, care Rock Products.

FLINT CRUSHING PLANT near LaFayette, Ind. Nothing like it in the country. Other business takes my time. EDWARD HELY, Cape Girardeau, Mo.

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MONEY MAKING Soft Mud Brick Yard. Great opportunity for a practical man. Good profit and can not supply demand; 30 thousand capacity. Will sell at a bargain on easy terms as owner has large interests. Write at once. TERRE HAUTE P. BRICK CO., Terre Haute, Ind.

ONE LIME KILN 40 ft. high; 30 feet encased in sheet steel, bolted together with patented funnel shaped bosh, discharging from center of kiln.

1 Jeffrey crusher; 1 Jeffrey stone elevator, used for conveying shells to top of kiln about 75 feet long.

1 swinging derrick with 30 ft. boom and 8 h. p. hoisting engine and two revolving discharge buckets.

1 belt conveyor 6 in. cups; 1 belt conveyor 8 in. cups; 1 75 h. p. engine; 1 75 h. p. boiler; 1 revolving screen; 8 sheet iron cars on wheels for hydrating lime. Two O'Connell patented boilers for lime kiln used in furnace to generate steam for artificial draft and 4 blowers with same. All the above is in good condition. LOUISIANA LIME CO., Hennen Bldg., New Orleans, La.

WOOD FIBRE PLANT for the manufacture of wood fibre and other wall plaster, two up-to-date lime kilns, a complete Clyde system for hydrating lime, all new, a good business established in the best city in the South. Address, AMERICAN WOOD FIBRE PLASTER CO., Box 267, Birmingham, Ala.

BUSINESS OPPORTUNITIES.

GOOD RELIABLE PARTIES to establish a cement factory; good inducements will be offered to reliable parties. Address, J. W. SANFORD, Chamberlain, S. D.

PARTNER wanted with \$5,000.00 cash, to take interest in concrete block business, having over \$20,000.00 in actual orders now on the books; completely equipped plant with sidetracks from two railroads and very complete equipment throughout. The same plant earned 200 per cent in 1906 upon a total capitalization of \$5,000.00. More capital and an active partner needed to expand the business; possibilities practically unlimited. The blocks of this plant have already been accepted by all local building authorities, and for six months the concern has been steadily turning away orders. Talk quick if you have the money and will appreciate an opportunity in the concrete industry where your capital can be doubled in one year and salary besides. Address Y 6, care Rock Products.

\$18,000.00 BUYS ALABAMA LIME WORKS. Easy terms. No better money-maker in the South, nearly 500 acres rock lands. Rare opportunity. LOUISIANA BUSINESS CO., New Orleans, La.

NOTICE!

As a basis for assessing damages in our infringement suit against N. F. Palmer, which, by a recent decision, has been referred to a master for an accounting, we wish to learn the location of every machine made up to this date, and we will pay a reward of \$5.00 for each and every name of purchaser or user of any kind of machine made by Noyes F. Palmer in excess of his sworn statement October 3, which is three, the names of which we have. HARMON S. PALMER CO., 1450 Girard St., Washington, D. C.

Simplicity
Practicability

THE X-L CONCRETE STONE MACHINE

A Tested Success from Results of Years of Experience.

Guaranteed to Equal in Efficiency any Four Other Machines and Save 20 to 25 per cent. in the Construction of "Dry Walls."

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The same plates can be used on all sides, finishing both the face and outside and inside returns, and can be inverted and intermingled, forming hundreds of different designs and combinations. Our blocks make all width walls, and form all parts of a building, the same as a brick.

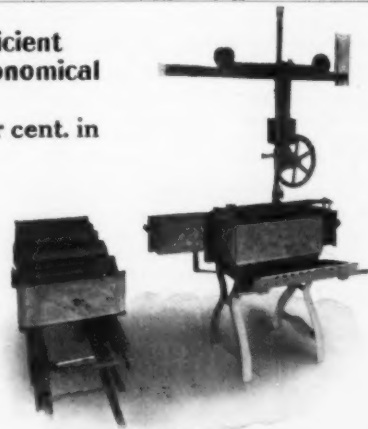
Bear in Mind you don't require five or six different size machines to do the work when using our X-L Machine. It makes blocks in 17 different lengths, 3-4-5-6 and 9 inch heights; angles and circles, for both full walls and veneering, giving a variety of over 1000 blocks; all made on the one size pallets.

Dry Wall Guaranteed without facing the blocks, or using face solutions, which are not only troublesome and expensive, but destroys the beauty and natural stone appearance. 10 to 25 per cent. saved in material without sacrificing strength. Our Off-Bearing Car and Automatic Loading and Unloading Truck has changed the back-breaking work under the old methods to almost child's play, saving 75 per cent in the cost of handling blocks. **We Back Every Statement We Make.**

See Catalog For
Prices.

E. E. EVANS, Mgr.

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Kansas City, Mo.



FOR SALE—MISCELLANEOUS.

STOCK—A limited number of shares of stock in the fireproof Penetrable Brick Co., is now for sale, par value \$5.00, non-assessable. We will manufacture building block, brick partitions and floor tile, sewer pipe, fence posts, railroad ties, piling, telephone and street railway poles, cattle guards, timber for shafts and tunnels, mine props, doors and window frames, sashes, etc. All made from slag concrete.

The penetrable brick, railroad ties and fence posts allows a spike, nail or staple to be driven in the same as wood. This is one of the greatest inventions of the age, and will give big returns for money invested. Open only a short time. Address W. J. SHELDON, President, Fireproof Penetrable Brick Co., 507 Locust Street, McKeesport, Pa.

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I am prepared to make complete investigations and reports. Write for Prices.

A. T. THROOP, Consulting Engineer,
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Yard Supplies of all Kinds

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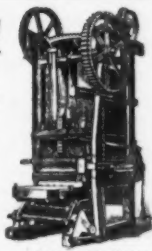
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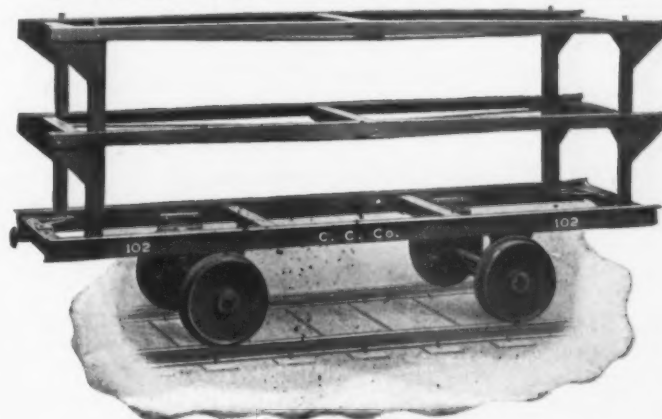
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Koppel, Arthur Co.
Oliver, Wm. J. Mfg. Co.
Watt Mining Car Wheel Co.
Woonham-Major Eng. Works

DUMPING BUCKETS.

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Woonham-Major Eng. Works

DYNAMITE AND POWDER.

Aetna Powder Co.
Dupont Powder Co.

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Bates Engineering Co.
Shoop, S. W. & Co.
Spackman, Henry Eng. Co.
Troup A. T.

ERADICATOR GRANITE STAIN.

Finerty, J. W.

EXCELSIOR.

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FIBRE MACHINERY.

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Elyria Mac. Works, The
Ohio Fibre Machy. Co., The

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Arbland Fire Brick Co.
Federal Clay Products Co.
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Mitchell Clay Mfg. Co.
Union Mining Co.

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American Sewer Pipe Co.

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Lombard Foundry and Mac. Co.

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Backus Gas Engine Co.
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Combustion Ut. & Eng. Co.
Packus Gas Engine Co.
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GRAVE VAULTS.

Parry, L. L.

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Grand Rapids Plaster Co.
Plymouth Gypsum Co., The
United States Gypsum Co.

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Abern, James
Anderson, A. & Sons
Averill Granite Co.
Barre White Granite Co.
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Blodau, J. O.
Blodau, Joseph
Bowers, R. C., Granite Co.
Doucette Bros.
Drennan & Brown
Eclat Granite Co.
Excelator Granite Co.
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Granite Ex. Co.
Mannex, T. F.
Mills & Co.
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Pirie, J. K.
John R. Richards
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Butterworth & Lowe
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Case Mfg. Co.
Shaw Elec. Crane Co.
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Kritzer Co.
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HYDRATING MACHINES.

Clyde Iron Works
National Brick Machinery Co.

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Central Ohio Lime & Stone Co., The
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Farnam "Chester" Lime Co.
Fowler & Pay
Goetz, C. W., Lime & Cement Co.
H. & C. V. & L. J. me Co.
Mitchell Lime Co.
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Pierce City White Lime Co.
Rochester Lime Co.
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Carpenter, R. H.
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Consolidated Stone Co.
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Indiana Bedford Stone Co.
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Oolitic Stone Co. of Indiana
Perry-Matthews-Busckirk Stone Co.
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Birmingham Iron Foundry
Johnston, August
Patch, F. R.

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Concrete Engineering and Equip.
Elyria Wood Plaster Co., The
Grand Rapids Plaster Co.
New Albany Wall Plaster Co.
Plymouth Gypsum Co., The
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Butterworth & Lowe
Dunning, W. D.
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Atlas Car and Mfg. Co., The
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Woonham-Major Eng. Works

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SAND-LIME BRICK MACHINERY.

American Clay Working Mach. Co.
American Sand-Lime Brick Co.
Huron Construction Supply Co.
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SAND PUMP.

Allis-Chalmers Co.

SAW BLADES.

Stone Workers Supply Co., The

SAWS DIAMOND.

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Allis-Chalmers Co.
C. O. Bartlett & Snow Co.
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Des Moines Mfg. & Supply Co.
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Power and Mining Machinery Co.
Tyler, W. & C.

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Rizzi Bros.

SLATE.

McKenna, David
New York Consolidated Slate Co.
Pennsylvania Structural Slate Co.

SOAP STONE FINISH.

American Soapstone Finish Co.

STONE.

Carthage Superior Limestone Co.

STONE WORKERS SUPPLIES.

Bowers, R. C., Granite Co.

STONE SAWS.

Lincoln Iron Works

STONE WORKING MAC. CO.

Stone Working Mac. Co.

STONE TOOLS.

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STONE WORKING MACHINERY.

Chicago Pneumatic Tool Co.
George Anderson & Son
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Lincoln Iron Works
New Albany Mfg. Co.
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Stone Working Machine Co.
Steam Stone Cutter Co.

STUCCO RETARDER.

Chemical Stucco Retarder Co.

TURN TABLES.

Broomell, Schmidt & Steacy

TUBE MILLS.

Allis-Chalmers Co.

WIRE ROPE.

Macomber & Whyte Rope Co.
Steam Stone Cutter Co.

NODAM-PWALL

The Cheapest and Best Waterproofing

Nodam-Pwall—A Fluid Compound has been invented, perfected, tried and found not wanting. When employed to subdue the affinity of seasoned cement brick or block and lime sand brick, to not absorb, but shed RAIN WATER.

The FLUID COMPOUND is used as a wash. Does not discolor or injure the product, but assists in making it more cohesive, hard and durable. This FORMULA and additional useful information entirely does away with efflorescence. Will permanently tint sand lime brick.

NODAM-PWALL is a new, cheap and useful compound which will cost about 3 cents per gallon. It was invented and perfected by an experienced contractor.

NODAM-PWALL does not close or fill up the pores of the cement product, but it satisfies the aluminous atoms in the atmospheric exposed surface. Its object is to make the brick or block immune; it does not absorb, but sheds the RAIN WATER. The interior pores of the wall will not receive, but be nourished from its exterior immune surface.

NODAM-PWALL compound does not visibly discolor the product. It will not injure the seasoned product, but it is analogous to the cement composition. Cement brick treated several years ago sheds the RAIN WATER today.

The ingredients employed in compounding NODAM-PWALL are used every day and even the uninitiated can apply the fluid and manufacture it. It can be stored for months when properly taken care of. This formula and the attached data will furnish the builder and cement worker information which will subdue the efflorescence of cement products above the surface of the ground. It will color the material. It is the only vegetable compound which limey substances will not affect. Tinted bricks after two years service, exposed to the rain and frost are not affected. It assists in making the material more cohesive and better fire-proof. By the addition of a mineral salt dissolved in water to form the tint solution, it can be stored for an unlimited time.

The cost per gallon is less than one cent and assists in breaking the monotony of the white-washed appearance of the sand lime brick edifice. Can be used to advantage on belt courses, pilasters, imposts, column pedestals, balusters, copings, trusses, etc.

The FORMULA and information described represent the fruit of years of study, observation and experiments, gathered by a practical contractor who employed the various materials in the erection of edifices for half a century. The inventor of NODAM PWALL has applied his thought to construction in his building business and NODAM-PWALL is not an experiment in any sense.

EVERY cement user, cement block and brick manufacturer and user, sand lime and brick manufacturer and user, and contractor will profit by purchasing this formula. The Price is \$5.00, which must be paid in advance and the signature of the recipient which guarantees the lawful owner of this NODAM-PWALL formula must sign a contract not to reveal the materials used or the mix which composes the formula, or the instructions as to its particular use.

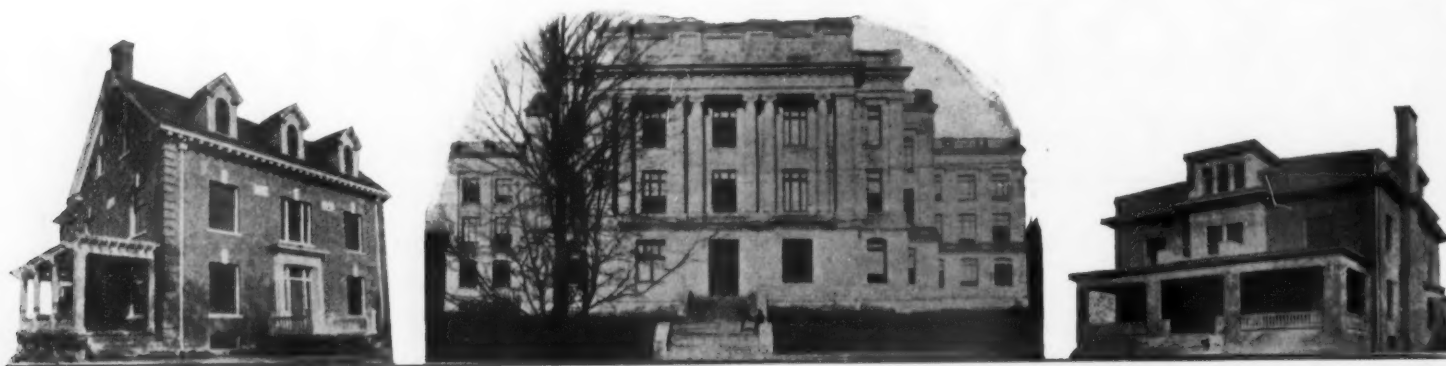
NODAM-PWALL is a winner. It will make you money. The investment is small and by integrity of purpose and the purchase and use of the same you can add to your success for 1907 by SENDING YOUR ORDER AT ONCE, and don't forget the name NODAM-PWALL.

THE ROESLING CO.

233 FIFTH,
LOUISVILLE, KY.

UNPROTECTED
BLOCK

NODAM-PWALL



These buildings were made better: your building can be made better by using

SACKETT PLASTER BOARD INSTEAD OF LATH

Sackett Plaster Board is a building material that should command the attention of every man who is interested in good building construction. It is displacing wood and metal lath in edifices of every type, and has earned the unqualified commendation of architects and builders everywhere. Every architect owes it to his clients, every owner owes it to himself, to investigate this material before making old-style specifications.

Sackett Plaster Board has succeeded, and is succeeding, because it is something more than a mere base to hang plaster on—it offers advantages and gives results that are not obtainable in any other way. It makes a warmer wall than wood lath, is cheaper than metal and resists fire far better than either.

The New Way.



Sackett Plaster Board

is not merely a substitute for lath. It can be used to good advantage somewhere in every building that is put up.

Sackett Plaster Board is an excellent fire retardent and sound deadener and can be used between floors to excellent advantage. It has also been used a great deal for sheathing, and those who have tried it are enthusiastic over the results. Tar paper used in ordinary sheathing usually cracks when the heat is turned on. **Sackett's Plaster Board** gives a warm, tight wall, and costs 25 to 50 per cent less than lumber and paper.

When used in interior work the plaster is put on with half the usual amount of water, which not only saves time (often an important consideration) through quicker drying, but reduces the warping and shrinking of timbers and trim. The finished wall is hard and firm, can be depend-

Results Considered. **Sackett Plaster Board** is the cheapest building material ever made. And its first cost, in many cases, is no more than is paid for antiquated, inflammable and unsatisfactory lathing.

This advertisement, necessarily, gives but a suggestion concerning **Sackett Plaster Board**, printed in the hope that it will interest those who contemplate building. If you are interested, and would like to know all about it, without obligation,

Drop a line today to any of the following distributors.

Sackett Plaster Board consists of alternate layers of felt and stucco rolled into sheets which are nailed to the studding, presenting a hard, smooth surface to which the plaster adheres perfectly. The board being non-inflammable, the result is a wall or partition that the underwriters will pass as "slow-burning" construction, that retains heat, excludes cold, and that is an effective sound deadener.

These and other advantages have kept the demand exceeding the supply for several years past, and the board has never before been advertised. Two new factories have recently been erected, however, and **Sackett Plaster Board** is now on sale in building material yards throughout the country. Address of nearest dealer furnished on application.

The Old Way



UNITED STATES GYPSUM COMPANY,
CLEVELAND, CHICAGO, FT. DODGE

GRAND RAPIDS PLASTER COMPANY,
GRAND RAPIDS, MICHIGAN

SACKETT PLASTER BOARD COMPANY,
17 BATTERY PLACE, NEW YORK CITY

REPRODUCTION OF FULL PAGE ADVERTISEMENT WHICH APPEARED IN THE SATURDAY EVENING POST, JUNE 16.

Cement Plant Location Near Pittsburgh, Pa.

The undersigned represents a certain party who has a large tract of valuable land near Pittsburgh, Pa., containing abundant ray materials for making a high-grade Portland Cement; also both natural gas and coal for fuel. Railroad connections right into property, and low freight rates to Pittsburgh. One of the best locations for Portland Cement Plant in the United States and in the midst of the greatest industrial center of the world.

Would like to correspond with parties looking for a location or with some practical cement man with capital who would like to join present owner in organizing a company to build a first class modern plant. I mean business and can make good every claim that I make to the property and its advantages.

Address, WALTER K. HOOD, 421 Wood Street, Pittsburgh, Pa.

W. D. MEYER,

Manufacturer of

Marble White Lime

115 Delaware Street, QUINCY, ILL.

**Peirce
City
White
Lime**



Before placing your order for any of the following articles it will pay you to communicate with the undersigned and secure their prices.

Treads	Urinal Stalls
Risers	Laundry Tubs
Platforms	Sinks
Blackboards	Tiling, etc.

The Penna. Structural Slate Co.,
EASTON, PA.

CONTRACTORS!

May we send you
FREE

(express prepaid)

for examination
a pair of the
famous

**Rubberhide
Boots**



uppers of best rubber; heavy leather outsole; rubber wet, leather insole, all joined together so that your best team of horses can't pull them apart. **Sewed, not pegged.** Can't leak; protects the feet; **snag-proof.** We guarantee them to outwear two pairs of best quality rubber boots.

Our business has more than doubled in the past year, the increase going largely to contractors. More than 2,000 pairs in use in (Penn) Hudson River Tunnel.

We want to send you a pair at our expense for examination. No obligation on your part.

Rubberhide Co.,

633 Essex Bldg., Boston, Mass.

THE GENUINE

GANDY

PATENTED 1877

GENUINE GANDY

Is Cheaper

both in first cost and because it lasts longer than either leather or rubber as a carrier of rough materials such as brick, clay, sand, rock, gravel, etc.

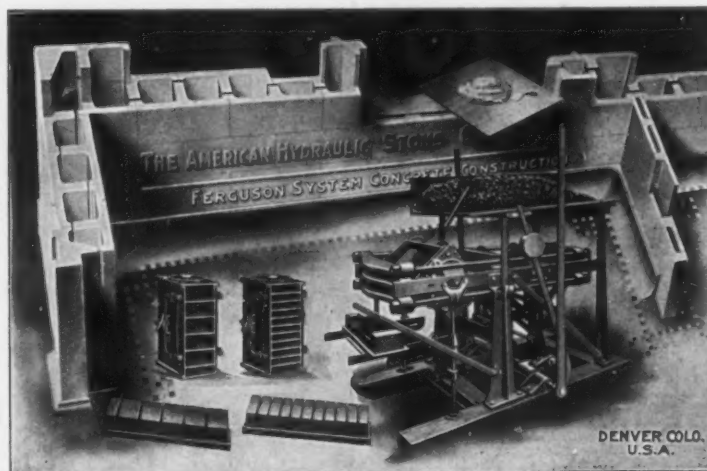
Can we prove it? Certainly, send for booklet.

GENUINE GANDY

GANDY BELTING CO.
BALTIMORE, MD.

Two-Piece Hollow Concrete Wall and Partition containing Header Bond and Continuous Horizontal Air Space. Impervious to Heat, Cold, Moisture and Sound. Fire and Vermin-Proof. Walls of all widths, blocks of all shapes and sizes. New Hand Press enables three men (mixture supplied) to make 1,200 blocks, 10,000 brick or 5,000 paving blocks in 10 hours.

The Walls of a Cottage are the Work of a Single Day.



80-Page Catalogue fully illustrated, mailed upon request.

**The
American
Hydraulic
Stone
Company,**

Century Building,

DENVER, COLO.

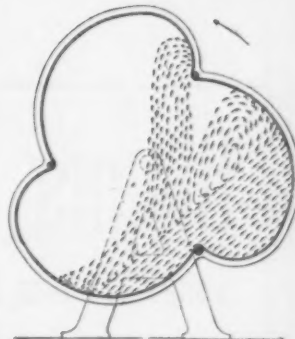
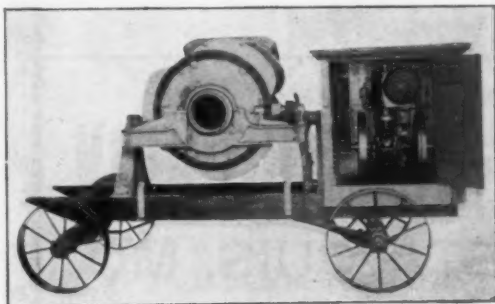
The "Clover Leaf" Concrete Mixer

HAS NO INSIDE MECHANISM

The material is doubled over NOT ROLLED.

Note the Points:-

Simple in construction.
Efficient—a mixer that mixes.
Easy to keep clean.
Made in sizes for large and small operators.
We invite inquiries for descriptive catalogue.

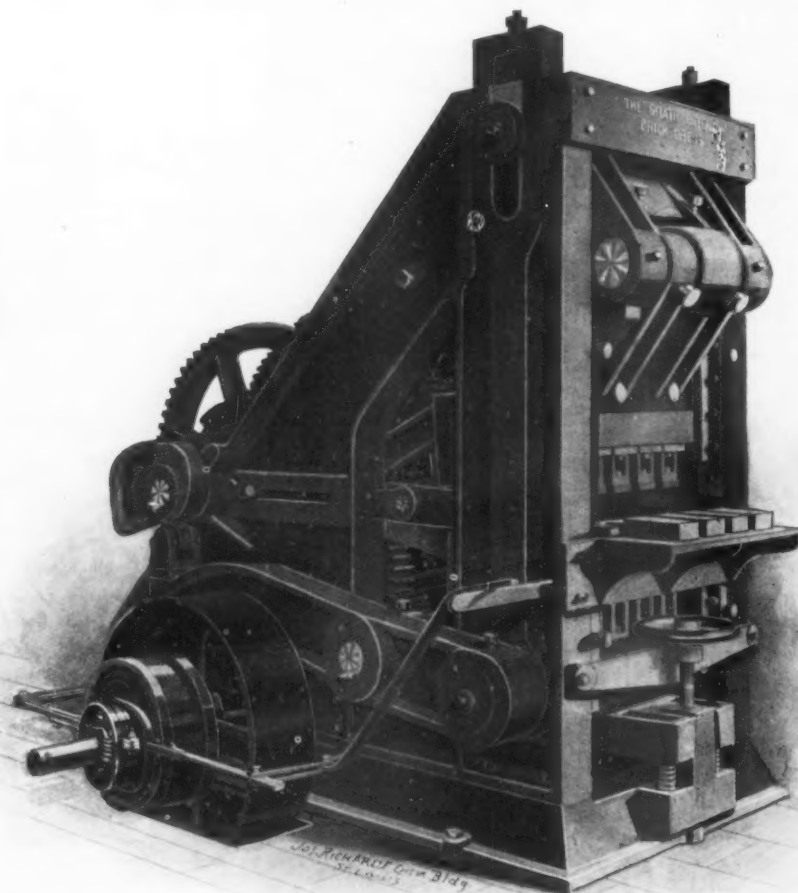


Address **THE "CLOVER LEAF" COMPANY,** South Bend, Ind.

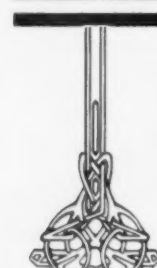
The Grath Four Mould Special Brick Press

For Sand-Lime Brick of Highest Grade,
also for Highest Grade Dry Press Brick.

Built in
Two, Three,
Four and Five
Mould Sizes



Only Press
Built on Cor-
rect Principles,
Only
Modern Press



Simplest and Best as Well as most Powerful Brick Press ever built. Guaranteed to make better brick than any other Press and to give complete satisfaction. Guaranteed against breakage. **Only Press Free from Side and Cross Breaking Strain.** Impossible to strain or twist crank shaft. ∴ ∴ ∴

FOR PRICES AND PARTICULARS, APPLY TO

Illinois Supply and Construction Company

Suite: 512 and 513 Colonial Security Building

ST. LOUIS, MO.

SOMETHING NEW!

A plaster finish without lime!

And without the troubles of lime!

As different from lime as
marble is from chalk!

A Plaster Product as Big
as the Market is Wide!

A Market as Wide as
the Need is Great!

AND THAT IS

“UNIVERSAL”

Made only by

UNITED STATES GYPSUM CO.

CHICAGO

CLEVELAND

FT. DODGE

MIXERS



Made in Three Different Sizes.

Simple, labor saving, light and handy to move around. We want to prove to you that we are many years ahead of our competitors. Write for catalog and be convinced.

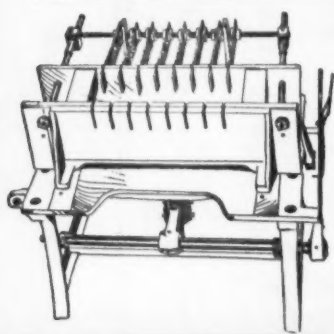
Write for Catalog 3.

EUREKA MACHINE CO.

420 N. Jackson St.

JACKSON, MICH.

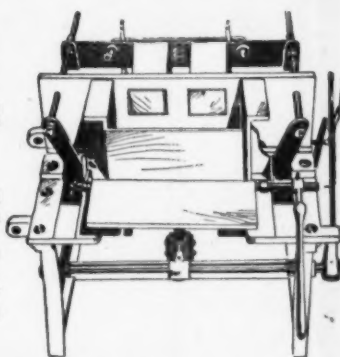
The "Reed" Machines are in the Lead



SPEED! SPEED! SPEED!
LOOK AT THIS!

E. W. Ellison, of Peoria, Illinois, reports manufacturing, on our Reed Junior Face Down Machine 210 concrete blocks per day, size 8x10x18 inches with extra Face, working three men who mixed their own material.

Why not get in the race and use a machine that lays your competitors in the shade and permits you to secure the business. Perfect blocks produced. Machines adjustable. Our right angle triangle blocks producing triple hollow walls excell all others and are guaranteed against frost and fire. You want a machine with speed, and the best wall that can be secured.



The Wichita Coal and Material Co., Wichita, Kan., U. S. A.

High-Grade Concrete Block, Brick, Post, Sill, Cap and Mixing Machinery

"Just remember 9"—"We have the Leaders"—"9 of them"

- 1 Normandin Concrete Block Machine (Face Side).
- 2 Peninsular Concrete Block Machine (Face Down).
- 3 Cemaco Concrete Block Machine (Face Side).
- 4 Champion Concrete Veneer Machine (Face Down).
- 5 Favorite Sand Cement Brick Machine with mechanical tamper.
- 6 Systematic Concrete Mixer.
- 7 Universal Cement Post Machines.
- 8 Practical Sill, Cap, Step, Lintel Mold.
- 9 Superior Ornamental Molds—Baluster, Bases and Balls.

Members of the National Concrete Manufacturers' Association.

CEMENT MACHINERY COMPANY, "Cement Bldg." Jackson, Mich.

Hundreds of Block and Brick plants in operation. The Hollow Block and Brick business is permanent and profitable, broadening in extent every day. It's not a question of material, but is a question of machine.

We are in the business, "first in field, established 1900." We can give you the best value for your money. Write us. Don't delay. Get started. Concrete blocks and brick are in demand. We solicit your trade because we can please you. Our machines are standard; adopted twice by the U. S. Government. Highest awards Universal Exposition, St. Louis, 1904, and Portland Exposition, 1906 for superior excellence.



NORMANDIN.



FAVORITE NO. 1.



A GOOD PAIR—Dever's Ball and Spindle Molds.

Architectural Ornaments

Pleasing Effects Can be
Produced by the Use of Our

BALL AND SPINDLE MOLDS

The cost is light, but rich, effective beauty is secured to your work. No plant can be called complete without them. We provide for the necessity that has been holding the cement industry back. Write to

DEVER'S CEMENT WORKS, CASSOPOLIS, MICHIGAN.

Do not wait till others get the equipment, it will pay for itself on one job.

Excellent Opportunities

for Stone Quarries, Crushers, Lime Plants, etc., are to be found in each of the seventeen states and territories of the West, Southwest and South along the numerous lines of the



Some of these stone deposits have been prospected sufficiently to warrant their complete development.

Portland Cement Plants

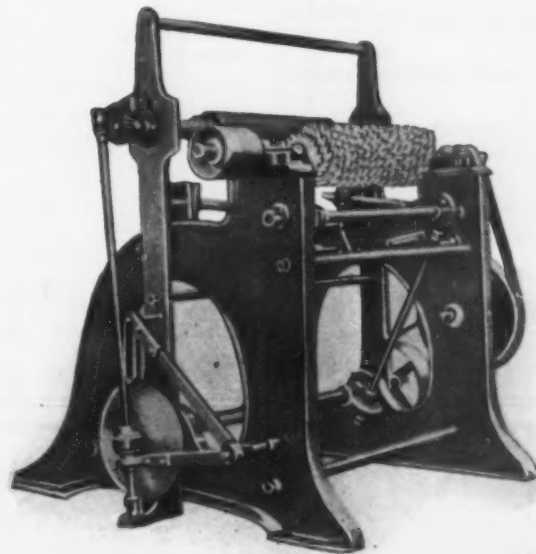
also could be located to excellent advantage at a number of points, as the proper raw materials are found in abundance, and cheap fuel—either natural gas or coal—is procurable.

Send for a copy of illustrated hand book "Opportunities" and other literature about industrial openings along the Rock Island-Frisco Lines.

M. SCHULTER, Industrial Commissioner,
Rock Island-Frisco Lines,
Frisco Building, St. Louis, Mo.

"The Cochran" Automatic Wood Fibre Machine

(PATENTS PENDING)



There is positively nothing cheap or shoddy about this machine, either in workmanship or material.

There are no Sprocket Wheels or Chains, no Cone Pulleys or Cog Wheels to break, get out of order and cause trouble. All the power is transmitted with bevel gears adjusted to "run like a watch."

We call special attention to the "speed increasing mechanism" and automatic action of our machine. When the log is reduced to the size of 2 inches the carriage is automatically released, and swings back to place without being touched by the operator, while at the same time the log stops revolving, without interfering with the other parts of the machine.

The log when finished is revolving six times as fast as at the start and all done automatically and continuously.

Write for catalogue and prices to

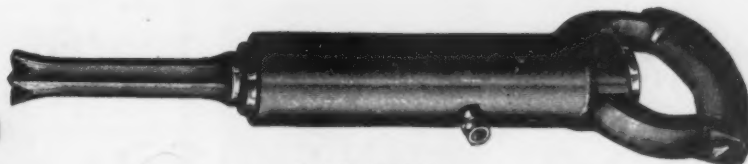
Concrete Engineering and Equipment Co.

Butler, Pa.

Greensboro, N. C.

WONDER ROCK DRILLS

Save Air, Labor,
Time, Money.



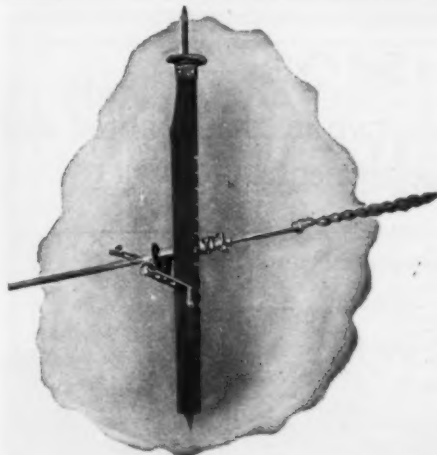
No. 1 Wonder Drill.

Drills that Drill. Contractors, Mine Operators and Quarrymen accomplish Results in Rock Drilling with Wonder Drills and Bits. Try the Pattern Best Suited to Your Work and be Convinced. Every One Guaranteed. Catalogue for the asking.

HARDSOGE WONDER DRILL CO. Ottumwa, Iowa. U. S. A.

Address Nearest Office for Particulars.

Denver, 439 17th St. Salt Lake City, 42 West 2nd St. Los Angeles, 212 S. Los Angeles St. Mexico, D. F. la San Francisco No. 7. El Paso, 412 N. Oregon St. Nogales, Arizona. San Francisco, Cal., 219 Spear St. Portland, Ore., 100 1st St. Seattle, 545 1st Ave., South. Butte, 56 Broadway, East. New York City, 68 Broad St. Chattanooga, Tenn., 6 E. 6th St.



HOWELL'S Celebrated Ball Bearing Heavy Geared Post Drills

for boring anything that
an Auger will penetrate.

Awarded Gold Medal, St. Louis.

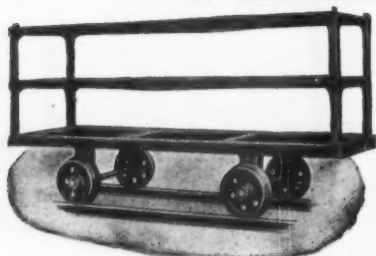
We make 40 different styles machines run by Hand, Compressed Air and Electricity for boring Fire Clay, Coal, Rock, Rock Salt, Gypsum and Plaster Rock. Send to day for our handsomely Illustrated Catalogue.

HOWELL MINING DRILL CO., Plymouth, Pa. U. S. A.

(ESTABLISHED 1878.)

Tell 'em you saw it in ROCK PRODUCTS

Roller Bearing Drying and Transfer Cars for CEMENT BLOCKS and BRICK.



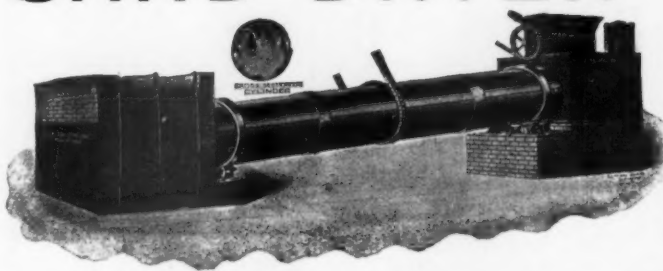
Do not buy a car where the corner braces extend below the beams of the deck as they spoil the end blocks.

The only car that has the center of the decks supported without the annoyance of center legs.

Write us for Catalogue No. 5.

The Chase Fdy. & Mfg. Co.
COLUMBUS, OHIO.

SAND DRYER

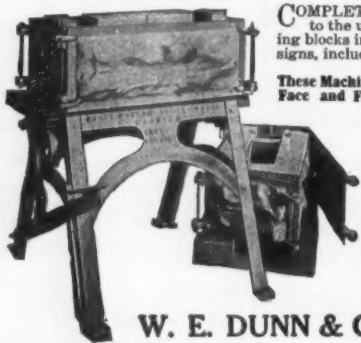


Dryers, Screens, Elevating and Conveying Machinery, Mixers, Concrete Building Block Machinery of all kinds, Power Tampers, Etc.

Ask for catalogue and prices.

The Standard Sand and Machine Company,
CLEVELAND, OHIO.

The Dunn Hollow Block Machine



COMPLETE in every detail. Especially adapted to the use of the Block manufacturer. Making blocks in all widths, lengths and many designs, including Sills, Lintels, Pier Blocks, etc.

These Machines Combine the Side Face and Face Down Systems. **Price \$100**

MASONS AND BUILDERS BLOCK MACHINE

MAKES blocks from 2 to 12 inches in width, up to 20 inches long in different designs. No expensive iron pallets required. A practical, rapid and economical machine for the Mason and Builder. No machine at any price makes better blocks or makes them more rapidly or economically. **PRICE.....\$40**

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Buy a HAYDEN for STRENGTH as well as RESULTS

The Hayden Automatic and Adjustable Block Machine is the only one on the market strong enough to withstand the heavy strain of pneumatic tamping. Write for booklet of what practical men say on the subject.

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HAYDEN, the standard of excellence. Send for catalog to-day

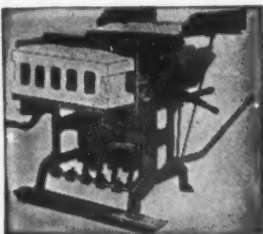


THE
Hayden Automatic Block Machine Co.
Box 705. COLUMBUS, O. 112 W. Broad St.
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HAYDEN AUTOMATIC & EQUIPMENT CO.
26 Cortlandt St. NEW YORK.
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IT IS A QUESTION OF ECONOMY

in buying a Concrete Building Block Machine the same as any thing else. You want the best, at the same time the cheapest. The SIMPLICITY fills both of these requirements.

Write for catalogue and further information.



"THE SIMPLICITY."

The Standard Sand & Machine Company,

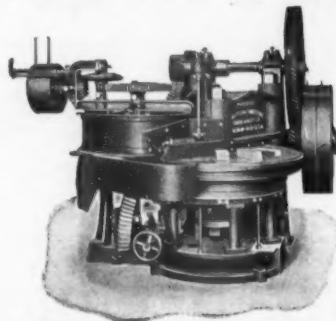
Manufacturers of Labor Saving Machinery.

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The American Sandstone Brick Machinery Company,

Dept. R. SAGINAW, MICH.



DON'T confuse our practical system with the so-called Scientific Systems. We have the Practical System, the Practical Machinery, the Practical Press, the Practical Hydration and the Practical Outfit, which is manufactured in our own shops, under the supervision of Practical Men with Practical Experience.

Our Plants are installed under the supervision of practical engineers who know how Sand-Lime Brick should be made, and can be made.

We have practical plants running successfully, to show to prospective investors.

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We produce results, because we are the oldest practical Sand-Lime engineering company doing business in the United States, and we defy contradiction. Incorporated April 1902.

Improved Kennick Rotary Presses are now being built right or left hand, with extra table for making face and fancy brick, on which double pressure is exerted. Our patented rotary brush does the work of one man, and keeps the plunger plates clean.

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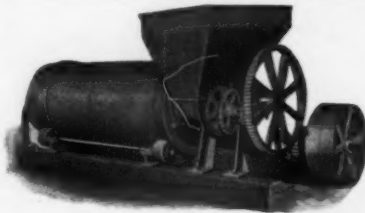
Try a line or two in the Wanted and
For Sale Department.

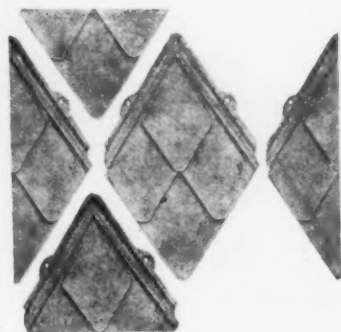
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The Hayden Mixer is a composite of durability, rapidity and economy. The materials are automatically fed. The drum is made of No. 8 gauge steel plate, made in two sizes. The reel is a spiral arrangement of steel knives. Send for Catalog "B"

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A product which overcomes every possible objection to cement roofing and offers a field at once inviting and profitable, especially for those now engaged in cement construction of any kind

Not all who build will use cement blocks, but nearly every builder is a possible customer for Cement Roofing. Opportunities are unlimited; profits are large. It will pay you well to investigate this business. Let us send you our handsome booklet. It's yours. Just ask for it.

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J. P. STOLTZ & CO., General Eastern Agents, 420 West 23d Street, NEW YORK CITY.

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FIRE BRICK, FIRE BRICK and FIRE CLAY are everlastingly our Specialty. Do you need anything in this line? If so, let us know your wants; let us figure with you. We can save you many dollars. WRITE US.

HIGH GRADE

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For Cement Works, Lime Kilns, Cupolas, Steel and Iron Works of every description

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will start September 1st. Capacity two hundred tons daily. They have an eight-foot vein of Gypsum and will be ready to fill all orders quickly, as they have the best equipped mill in the country.

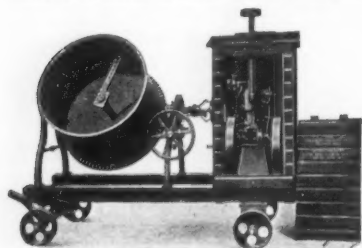
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Portable Power Outfits \$270 to \$470, according to size and equipment.

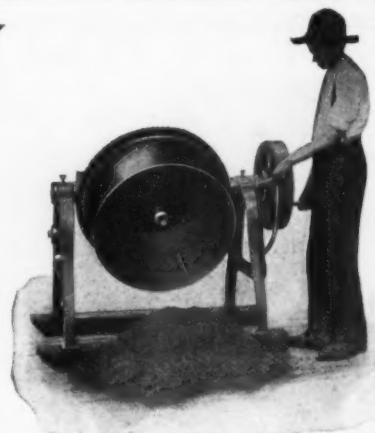
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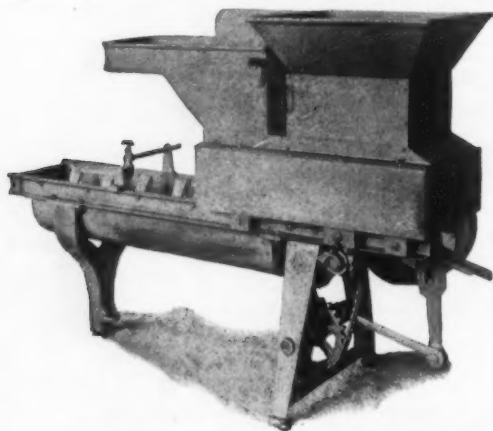
The **STANDARD PORTABLE MIXER AND ENGINE** are mounted on suitable truck, well designed, convenient to operate.

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South Bend Machine Mfg. Co.,
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The Standard Continuous Concrete Mixer

"The Mixer that Measures and Mixes."

"You fill the Hoppers, the Mixer does the rest"

CONTINUOUS, AUTOMATIC, FEED EXACT PROPORTIONS.

Materials first Dry Mixed, then "Tempered." Output instantly variable from 0 to Maximum at will of operator, thus insuring Fresh Material for each Block. Feeds Sand and Gravel Dry or Wet.

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The Standard Machine Co.,
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Cement Building Block the Coming Material.

We are Agents for Machines that Make the Blocks.

We are operating one of the largest block plants in the South, and are in position to demonstrate its success — also manufacturers of crushed stone for concrete purposes.

The Amount of Investment

Necessary to Make Blocks

is Small. . . . Why Not

Be the One in Your Town

to Take Hold of It?

If you will buy the Machine, it will prove a paying investment.

Write us for particulars, also catalogue.

We cheerfully answer all questions.

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THE PERFECTION POWER BLOCK MACHINE For Making Hollow Concrete Blocks.

The Only Machine Making Hollow Blocks Under High Pressure.

100 TON PRESSURE
ON EVERY BLOCK.

600 TO 1000 BLOCKS
PER DAY.

OUR MACHINE MADE THE SAND-LIME BLOCK ON EXHIBITION
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WRITE US FOR FULL PARTICULARS.

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MORTAR
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The Strongest and Most Economical in the Market.

Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

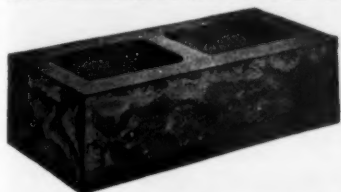
CHATTANOOGA PAINT CO., CHATTANOOGA, TENNESSEE.



McKelvey Batch Mixer

Does not dump under drum and frame. Note the long discharge spout. Its object and advantages explained in new booklet, ask for it. Once used no other is good enough. All sizes.

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MOVE THE MACHINE—NOT THE BLOCK

Saves labor of offbearing, loss by damage or breakage. Avoids necessity for heavy and expensive iron pallets. Reduces cost of plant and cost of operation. Everybody knows that concrete should not be disturbed after it is moulded or while it is setting, but this is the only machine with which it is possible.

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Blocks cost 6 cents to make—Sell for 15 cents. One man can make 200 Blocks per day. Whole outfit costs \$125.00. Figure the profits.

GUARANTEED EVERY WAY—SENT ON TRIAL

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The Latest Improvement in Building Material.

A Product in Itself, No Imitation.

“ART MARBLE,” “LITHOLITE”

—and—

Concrete Building Blocks.

THE THOMAS

Block and System of Insulated Walls

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Strength, Durability and Beauty.

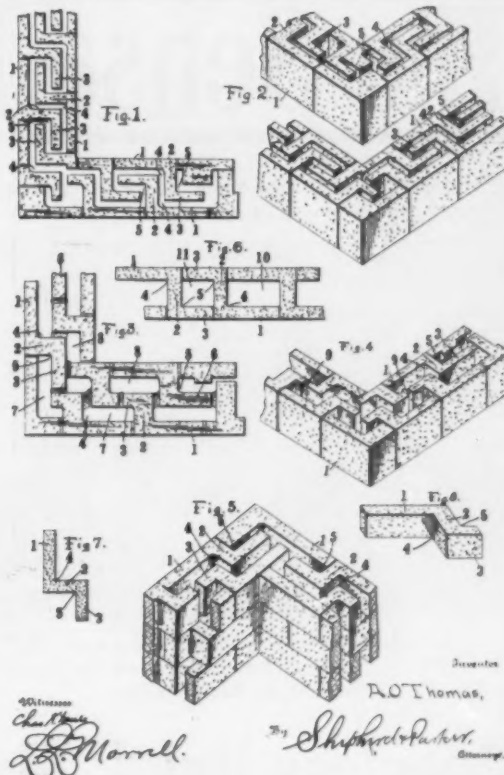
As far superior to common imitation stone as pressed brick is to common, and much cheaper. Our process is based upon scientific principles. Machinery and cost of manufacturing reduced to the minimum.

BLOCKS NON-ABSORPTIVE
WALLS FROST PROOF

AGENTS WANTED

Buy while Introductory Prices
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Patents fully Cover System.



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Fisher Hydraulic Stone Machinery

**Is the only Machinery
Perfected for making
True Concrete Stone.**

HYDRAULIC POWER SYSTEM.

A 200 Ton pounding, tamping pressure, uniformly applied.

Condenses the concrete 30%.

Same density from center to surface.

Allows the use of sufficient water to make a plastic mix.

Cement thoroughly crystallized.

These conditions produce true stone of great density and strength.

Stone of all sizes and shapes within dimensions 68x18x9 inches.

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Solves the problem of producing a high grade, reliable building material at moderate cost.

The demand is constantly increasing. Lumber will soon be exhausted.

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By-products of quarries, mines, furnaces, etc., utilized.

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Complete operating exhibit at Convention of National Association of Cement Users, Chicago, January 7 to 12, 1907.

Fisher Hydraulic Stone & Machinery Co.

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The Sensation in Cement Brick

The Peerless Cement Brick Machine is making brick for the new Minneapolis Armory.



All outside walls are made of cement sand brick, which are now being manufactured on the ground by the Peerless Cement Brick Machine.

**Practical
Durable
Economical
Profitable**

One man has made on this machine, over 3,000 perfect brick, in ten hours.

Prices right.

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and PRICE.**



Patent No. 811,518

PEERLESS CEMENT BRICK MACHINE.

Giving you a view after delivering a load. At the top stands the steel facing plate, used only in facing end brick. At the right are tamping mallet, collar and float. On the pallet are ten complete bricks, one showing a rounded corner. Attachments for all forms of ornamental brick furnished extra, and easily adjusted.

Peerless Brick Machine Co.

100 "A" Lumber Exchange,

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QUALITY
STRENGTH
RELIABILITY
DURABILITY
ECONOMY
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The
American Gypsum Co.

HIGH GRADE STUCCO. ANCHOR CEMENT PLASTER.
ANCHOR WOOD FIBRE PLASTER.
SUPERFINE CALCINED PLASTER.

General Office, Cleveland, Ohio Mill, Port Clinton, Ohio

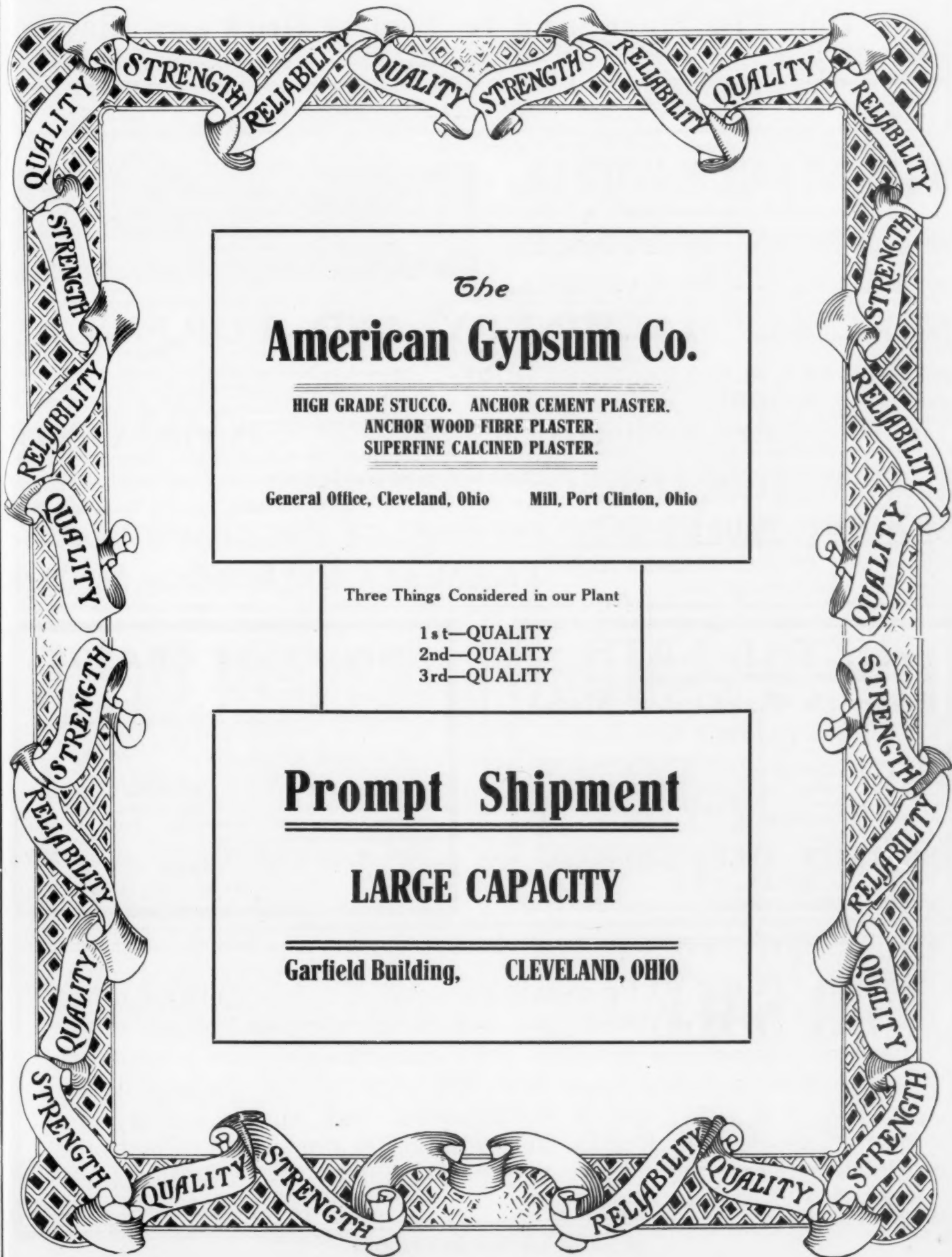
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1st—QUALITY
2nd—QUALITY
3rd—QUALITY

Prompt Shipment

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The Only Fire-Proof Sand for Cement Brick and Blocks

THE IDEAL SAND FOR SAND-LIME BRICK
 THE BEST SAND
 GLASS MANUFACTURING FOUNDRY PURPOSES
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 PURE WHITE AND BUFF
 99% Pure Silica
 THE BEST OF KNOWN
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 KENTUCKY SILICA COMPANY, LOUISVILLE, KY. MINES ON I. C. R. R. AT
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Wheeling Plaster and Builders Supplies.

WHEELING, - - WEST VIRGINIA.



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FOR THE MANUFACTURE OF

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We furnish the latest improved FIBER MACHINE, (fully patented),
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Bostwick Expanded Metal
 BOSTWICK FIRE-PROOF STEEL LATH

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For Brick, Mortar, Cement, Stone, etc.

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FOR QUALITY AND STRENGTH
WE LEAD.

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WILL NOT RUST

If properly cared for. Roofs put on forty
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are in position to fill all orders promptly. Those who have used our goods claim it is the
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If you have not tried it, we are sure it would be to your interest to do so.

Prices always right and your orders solicited.

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Gentlemen:—We are very much pleased with your machine, as is evidenced by the fact
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which we have found takes more power to run, with about one-third the output of your
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Has an Automatic, Proportional, Increasing
Feed, which keeps grade of fiber
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for the grade of fiber and number
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as do the ordinary non-increasing feed
machines. Works logs up to 24x24 inches.
No royalty string attached to sale. Pay no
attention to misrepresentations of our
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The Shuart-Fuller Mfg. Co.

Successors to

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Cement Plaster
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The Brand that's Made from Pure Gypsum Rock.

Correspondence Solicited.

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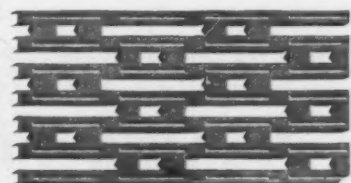
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SOLID PARTITIONS
ERECTED WITHOUT
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ABSOLUTELY FIRE-PROOF
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BEST FOR STUCCO WORK,
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LEADS
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SMALL KEY-LEVEL
SURFACE.

Strong, Rigid, Durable.
Write for Samples.

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STUCCO RETARDER

Our new Air Separation Plant gives us some
of the finest ground and most uniform
Retarder made, with strength equal to any.
Let us submit sample, and prove it.

Chemical Stucco Retarder Co.

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PATENT SOAPSTONE FINISH

PLAIN AND IN COLORS FOR WALLS AND CEILINGS.

Patent Soapstone Mortar.

Prepared in any Color for Laying Pressed and Enamelled Brick,
Stone Fronts, Terra Cotta, Chimneys, Fire Places, Etc.

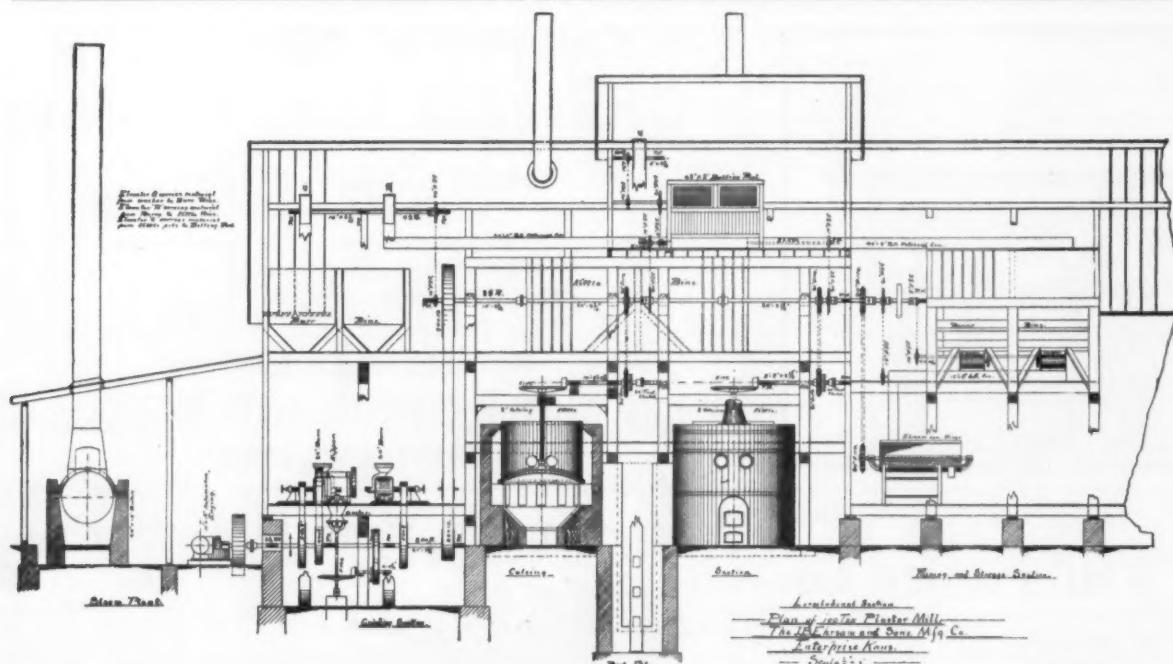
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SOAPSTONE MICA. CONCRETE DRESSING.
CRUSHED, GROUND AND BOLTED SOAPSTONE.

AMERICAN SOAPSTONE FINISH CO.
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Calcining Kettles
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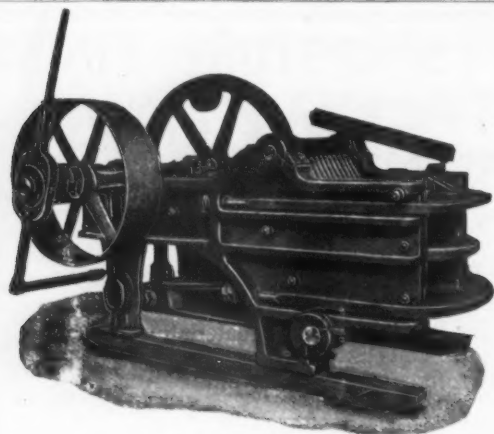
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KETTLES, CRUSHERS, NIPPERS, ETC.

We are now building the new Plymouth Mill at Fort Dodge, Iowa, the finest mill in the United States.

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for soft rocks, burnt lime, etc.

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We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhns, Screens, Elevators, Shafting etc.

SPECIAL CRUSHER-GRINDERS FOR LIME HYDRATORS.

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HIGH Quality—Attractive Prices—that's the Double Impression we aim to give our Customers. We want your business. Shipments made from mills located in the North, East, South and West. Place your next order with "Bell in the Business 50 Years."

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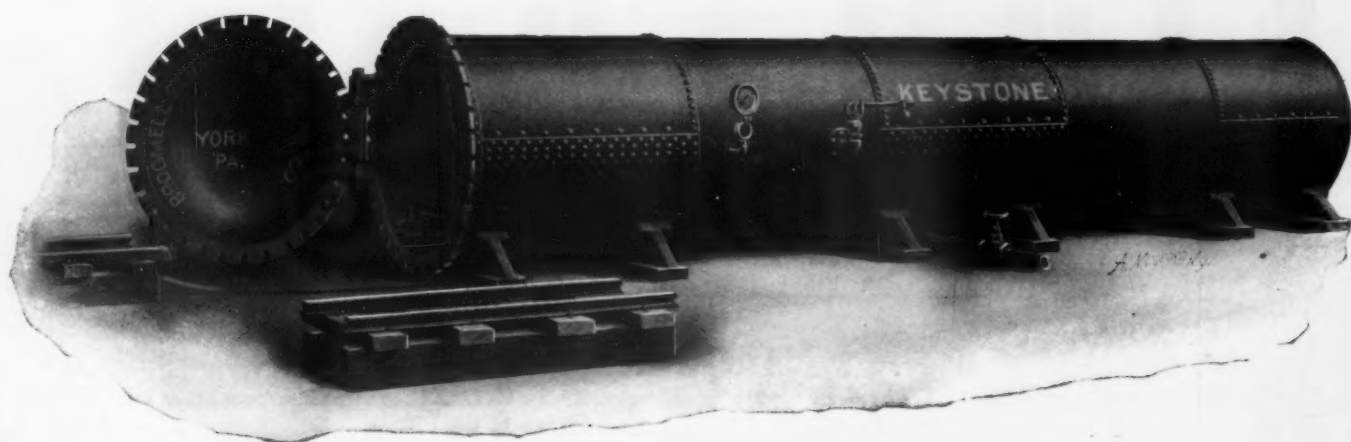
PITTSBURG,

PENNSYLVANIA

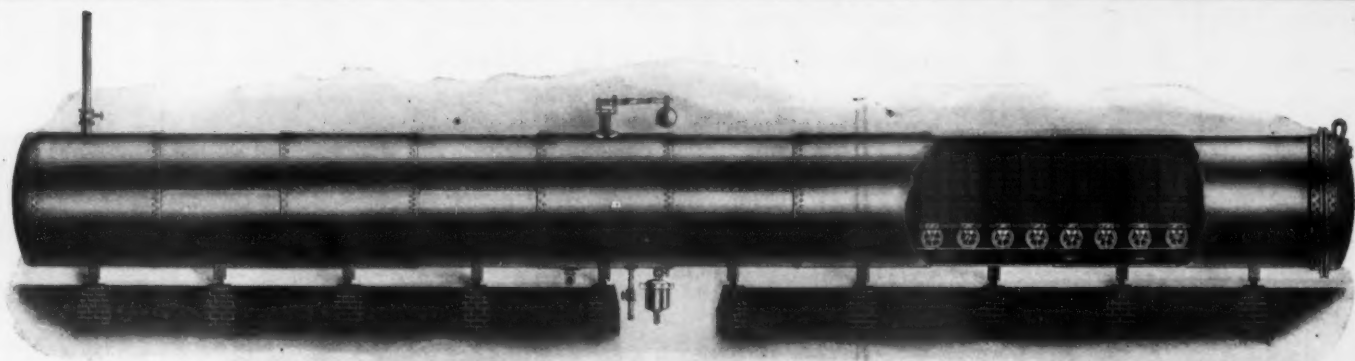
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BINS, ELEVATORS. CARS, HYDRATING MACHINES.

SPECIAL WORK OF ANY KIND BUILT FROM BLUE PRINTS.



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Our Sand-Lime Brick Machinery is at least a little better than any other. We have testimonials to show it. We build it all in our own factory and are sure of its quality. We are the only firm doing this. We will design and equip your entire plant or will sell you parts of your equipment. Our catalog describing and illustrating our full line will be sent upon request.

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Everything we sell we make. We therefore know its quality to be right.

The American Clay Machinery Co.,
WILLOUGHBY, OHIO, U. S. A.

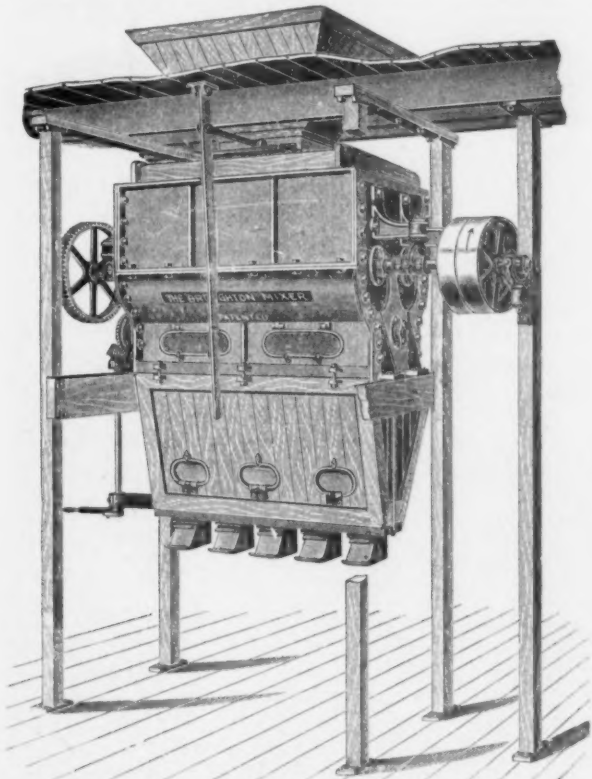
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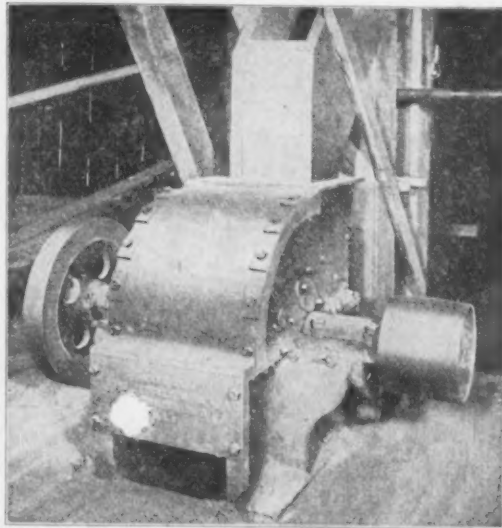
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The most thorough and efficient
Mixers of Plaster, Cement and
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IN OPERATION—GRINDING GROC.

Manufactured by

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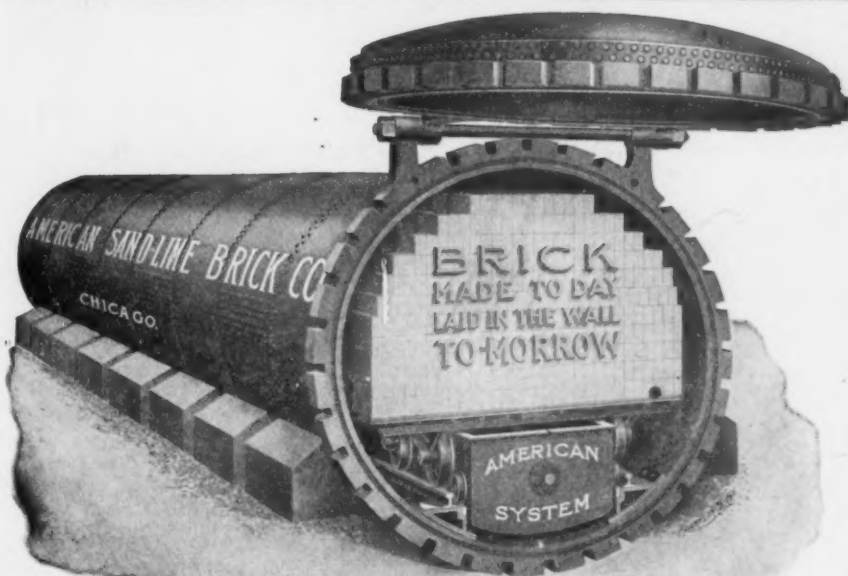
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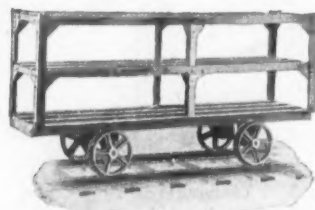
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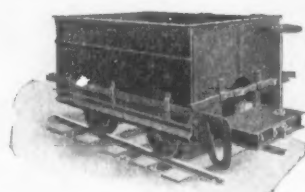
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